Scientific American.

THE ADVOCATE OF INDUSTRY, AND JOURNAL OF SCIENTIFIC, MECHANICAL, AND OTHER IMPROVEMENTS.

VOLUME XI. NEW-YORK, MARCH 8, 1856. NUMBER 26.

THE

Scientific American,

PUBLISHED WEEKLY

At 128 Fulton Street N. Y. (Sun Buildings.)

BY MUNN & COMPANY.

O D MUNN, S. H. WALES A. E. BEACH.

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Single copies of the paper are on sale at all the periodical stores in this city, Brooklyn, and Jersey City.

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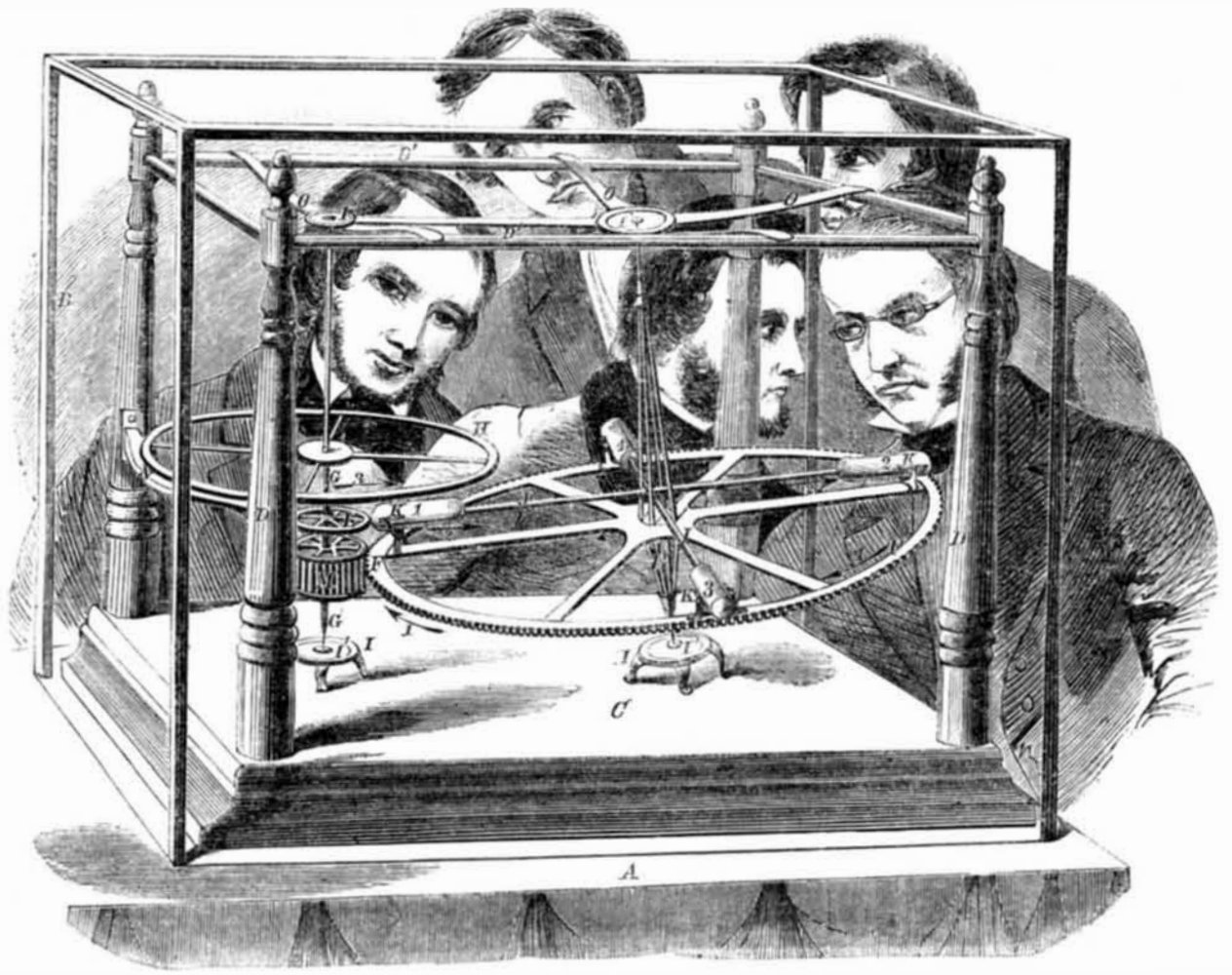
NEW PERPETUAL MOTION.



Willis' Perpetual Motion.

One of the immutable laws of dynamics is, that all bodies when once set in motion, will continue their movements until stopped by some opposing force. Thus, a wheel placed upon a shaft, and made to revolve by means of the hand, would never stop from any cause contained within itself; it would always continue to revolve with a force exactly equal to the power that was originally imparted to it in the start.

The only known opponents to continued motion are friction, gravity, and resistance of the air. Whoever succeeds in constructing a mechanical device that, in itself, wholly overcomes these, will have produced what the world has never yet seen, viz.:—*a self-moving machine.*

Many attempts have been made during the last three centuries to evade the dynamic law first above mentioned; or rather, we should say, many persons, through ignorance, or inability to comprehend the law in question have gone industriously to work to produce machines that would, of themselves, not only generate force enough to impart and preserve their own motion, but also transmit power for mechanical purposes. All such efforts have, of course, come short of the mark. We could fill many pages of our paper with descriptions of pretended perpetual motion machines, some of them very curious, if it were necessary; let it suffice to refer the reader to the engraving of Austin's self-moving machine, on page 209, Vol. 2, SCIENTIFIC AMERICAN, and to another on page 267, same volume, as specimens of what has been done in this line.

The attempts to find self motors have, in many cases, resulted in the production of apparatuses in which the parts were so accurately made, and the friction so greatly diminished, that the contrivances, after being set in motion, would continue to move for a long time. Thus, a pendulum has been placed in a vacuum, and arranged to move with so little friction that, when once started, it continued to vibrate for three days; the exhaustion of power by friction and resistance were, in this case, so gradual as to be imperceptible to the eye.

The construction of a perpetual motion is an impossibility, but to make a moving machine, having its motive power concealed from view, is a very easy task. Hundreds of such contrivances have been made, and in more than one instance their owners have sought to impose upon the credulity of the public by unblushingly asserting that such machines were self-moving.

In former times these exhibitions were perhaps profitable to their cheating exhibitors—if not to their deluded victims. But mechanical and other marvels are so common now-a-days that we doubt whether such shows can, at present, prove very remunerative.

One of the latest attempts at "Perpetual Motion," is that of Mr. E. P. Willis. His machine was first put on exhibition at New Haven, Conn., but it has lately been brought to New York. Our engraving conveys a clear idea of its appearance and construction. It is heralded to the public through advertisements and placards like the following?

PERPETUAL MOTION!

THE GREATEST DISCOVERY EVER YET MADE.

Is now on exhibition at

565 Broadway, (Up-stairs.)

THIS MACHINE was manufactured in New Haven, and is the invention of Mr. E.P. Willis, by whom it was successfully exhibited in that place, and agreeably to public opinion, and the approbation it met with, it is beyond a doubt, the Greatest Curiosity, and the most successful attempt at a Self-acting Machine ever made in this or any other country.

Why it is not a *bona fide* Perpetual Motion, is left for the curious on that subject to determine.

CALL AND SEE IT!

and our word for it you will not regret the trouble.

Hours of Exhibition from 9 *to* 1; 2 *to* 6, *and from* 7 *to* 10.

ADMISSION 25 CENTS.

Agreeable to the above invitation we went to see the *elephant*, and found it in a second story front room, on Broadway. The contrivance rested on a common table, and was carefully separated from close scrutiny by a glass case. We urged the exhibitor several times to remove the case and give us a fair chance either to satisfy ourselves that it was a genuine "perpetual motion" or to detect the trick, but he positively refused. He said it was a very delicately-constructed apparatus, and was fearful that it might be injured if the case were taken off. The movements and general arrangement of parts were to be clearly seen through the glass, and for the amusement of our readers we will describe them.

Referring to the engraving, A is a table on which the machine rests, B the glass case, C base of the machine, D D' frame. E is an inclined shaft, carrying the driving wheel, F. G is a vertical shaft, carrying a fly wheel, H. The bottom bearings of shafts, E and G, are steel points, and rest upon small stands, I, slightly elevated, as shown. The stands are simply metal frames which support flat disks of glass, I'. In the center of these glass disks are metal bearings, on which the points of the shafts are placed. The upper bearings are arranged in the same manner, so that the shafts are perfectly insulated. The observer is therefore supposed to satisfy himself that the machine is not propelled by any electrical contrivance or other means introduced through the shafts. O O' are braces for supporting the bearings. The driving wheel, F, is placed on an angle, and carries four small weights, 1, 2, 3, 4, which are connected in pairs by the rods, J. The weights are supported on the small guides, K, and slide laterally. The wheel appears to be inclined just as far as can be without causing the weights to slide back of their own gravity after being pushed up.

Attached to shaft, G, is a small wheel, L, the office of which is to move the weights, and this is apparently done in the following manner. Driving wheel, F, moving in direction of arrow 1, brings weight 1, in contact with wheel, L; the result is, that weights 1 and 2 are pushed forward in direction of arrow 2, weight 1, being thrown in towards the center of wheel, F, while weight 2, is thrown beyond the periphery of the driving wheel. Weight 2, therefore, has an advantage of leverage over weight 1, and the wheel, F, being placed on an angle, accordingly rotates in direction of arrow, 1. The movement of the weights takes place just after reaching the highest point of elevation, or dead point. The movement of wheel F, brings all the weights in contact, one after the other, with wheel L, in the manner described, and thus, as the exhibitors allege, continuous rotary motion is produced. Motion is transmitted from the driving wheel, F, to shaft, G, by means of the pinion, M, which gears with F, as seen. The extremities of the weights, where they come in contact with the pushing wheel, L, are rounded so as to lessen the friction. Any one would suppose that the machine would stop whenever a weight touched wheel L; but the exhibitors allege that the momentum previously acquired is sufficient to overcome the resistance, and also to push up two weights at once, thus renewing the propelling force continually, and rendering the contrivance a self-moving machine, perpetual in its motions—perpetual until the parts wear out. The large weighted wheel revolves about five times per minute, the fly wheel about fifty times. N is a brace, placed in very suspicious proximity to the fly wheel, The fly wheel is not solid; it consists of a shell of brass, of which a section would resemble the form of an inverted U. There appeared to be a series of holes in the upper surface of the brace directly beneath the fly wheel, and covered by the latter. The fly wheel also seemed to touch the brace at each revolution.

This machine is very beautifully constructed. The shaft bearings are fine steel points and have but little friction. Possibly it is one of those contrivances that will run for a few hours without stopping, owing to nice adjustment and the trifling amount of friction; we are inclined to think, however, that it is driven by electro-magnetism, but perhaps it is operated by some other concealed power. The weighted wheel is evidently intended to attract the attention of the spectator—in other words, to tell a plausible lie—to make people believe that the weights give out more power in coming down hill than is required to take them up.

The ideal water wheel to work a pump and lift water enough to keep the wheel always moving, is planned on the same principle.

The parties interested in this machine wisely refuse to submit it to close inspection, and therefore we cannot reveal all its secrets. In their placards they say:—"Why it is **not a** *bona fide* 'Perpetual Motion' is left for the curious on that subject to determine." But after thus inducing spectators to come, they allow no one a fair opportunity to examine, and thus determine. It savors more of audacity than smartness, to ask the *curious* to point out the secret moving power of the toy, while at the same time it is purposely kept excluded from scrutiny.

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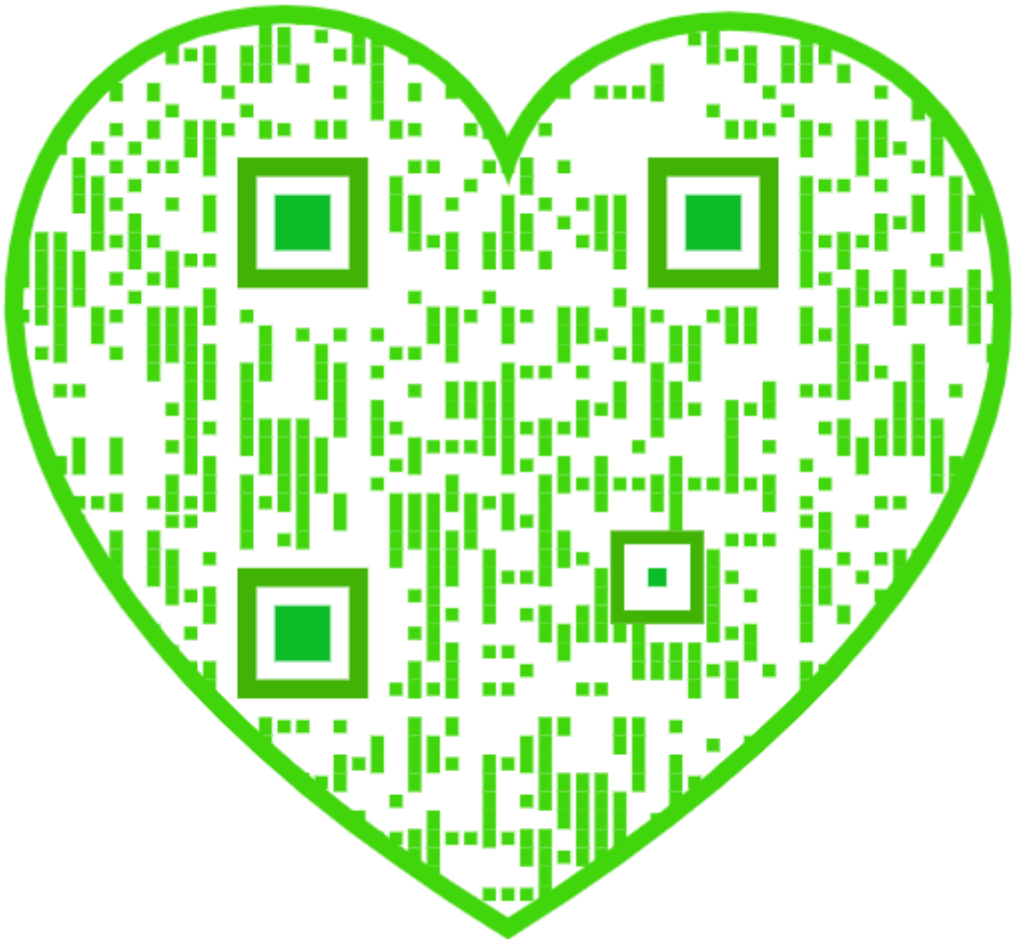

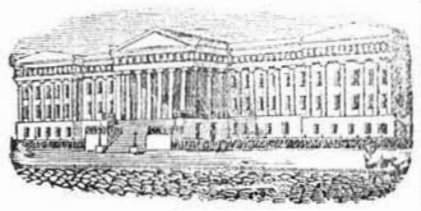

[Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING FEB. 26, 1856.

DEPOSITING COAL IN CELLARS—William Bell, of Boston, Mass.: I claim the bed plate conductor and slide with the tube attachments, in connection with a hole in the cart or other vehicle, as set forth.

PITMAN—Andrew Blaikie & Walter Clark, of St. Clair, Mich.: We claim the exclusive application of the hollow rod or tube, A, and the combination therewith of the wood, B, bushes, C C, and straps, D D, gibs, E E, keys, F F, and bolts, K K, in the manner and for the purpose substantially as described and shown.

EDGING WALL PAPER—H. J. Brunner, of Nazareth, Pa.: I do not claim revolving shears upon feeding rollers, but I claim the bearing pivots, d d, supporting arms, N N, movable blocks, L L, sliding carriage, c b, and adjusting device, S P b, arranged and combined in the manner and for the purposes set forth.

I also claim the sliding clamps, ff, constructed and operating substantially as set forth.

I also claim the combined arrangement of the rolling and unrolling devices, so that they may be quickly shifted from one side of the machine to the other, for the purpose specified.

WAGONS—B. B. Bundy, of Walton, N. Y.: I claim the mode of combining the springs and axles of wagons, substantially as set forth.

MILL SAW—Nathan T. Coffin, of Knightstown, Ind.: I do not claim the spreading of the square edged teeth by the use of the forked punch, or otherwise. Nor do I claim the bevel or diamond pointed teeth, nor the tapping down nor the turning of the points of the teeth by the use of the hammer or otherwise.

But I claim the arrangement of the common shaped mill saw, teeth on the blade in sets of three teeth, each with a wide deep space under the lower tooth of each set of teeth. Also the increasing of the spaces of teeth, from the center of the saw each way to the ends. Also the regular combination of the square edged and the diamond or bevel pointed teeth, the former standing straight with the blade.

COMBINED KNIFE AND PENCIL CASE—Richard Cross, of Attleborough, Mass.: I do not claim a handle formed with the chambers or recesses for receiving several instruments, which respectively slide into and out of said recesses and chambers,

But I claim my improved mode of constructing such a handle, viz.: of two separate tubes, o, formed and applied that when one is extended through the other, it shall not only serve to support it on two of its opposite sides, so as to prevent them from being crushed inwards, but form with the remainder of the enlarging tube, and between it and the latter, one or more chambers for the reception of instruments, as specified.

I also claim arranging the spring of the knife blade in a slot made through the shank of the blade as described, the same being in manner and for the purpose as set forth.

DOVETAILING MACHINE—Ari & Asahel Davis, of Lowell, Mass.: We claim the arrangement and operation of the cutter heads, X, b, and L, one movable and adjustable with the bar, D, which carries it, and the other stationary, so as to bevel and form the groove in one end of the wood, and bevel and form the tongue to fit this groove on the opposite end of the wood at one single operation, so as to complete the dovetailing of each piece, of any desired length, without changing the cutters, essentially in the manner and for the purposes fully set forth.

We also claim the carriage B, or its mechanical equivalent, and its movable and adjustable slide, F, which carries the board being dovetailed, and which can be moved and adjusted in conjunction with the bar or way, D, and cutters, thereon, so as to give any desired length to the board, essentially in the manner and for the purpose set forth.

SHIRT COLLARS—Othniel W. Edson, of Troy, N. Y.: I will here state that I do not limit my claim to the particular modes described, of giving the desired or necessary movements to the jaw, tongues, and blades, as other devices besides the cams and levers shown in the drawings, can be effectually employed in their stead for these purposes.

I claim the jaws, A B, tongues, C D, and blades, E F, when the same are combined and operated substantially as herein described, to simultaneously fold inward two contiguous edges of double cloth.

Second, I claim giving a forward longitudinal motion to the blades, E F, immediately after the edges of the cloth have been turned inward thereby, as described, to complete the formation of the corners of articles folded.

CHURNS—J. W. Fiester, of Winchester, Ohio: I claim the cams, b, and eccentric circle, e, in combination with the agitators for the purpose of breaking or cutting the current of cream in its passage through them, and for producing friction by the lateral motion of the two sides of the agitator, as described and for the purposes set forth.

BOX FOR CARRIAGE HUBS—A. C. Garratt, of Roxbury, Mass.: I claim the combination and arrangement of this peculiar lubricator or its equivalent, with the recess grooves or oil chamber of the box, in the manner set forth and shown, so as to form an improved combination wheel box for carriage axles.

COUPLING FOR THE JOINTS OF FELLIES—S. A. Garrison & D. C. Morey, of Chelsea, Mass.: We do not claim of itself a mere overlapping brace tightened by a separate bolt, as is used for stiffening joints.

But we claim the stay bolt composed of head, stay and bolt as described, in combination with the embracing cap piece tightened, as specified, for securing the joints of fellies from lateral movement, in addition to security against radial action.

AIR-COCK FOR STEAM HEATING APPARATUS—S. J. Gold, of New Haven, Conn.: I claim the automatic regulation of the air cock by the secondary action of a fluid which vaporizes at a low temperature, substantially as set forth.

GIRDERS FOR BRIDGES—Peter C. Guion, of Cincinnati, O.: I am aware that a trussed girder of the bow string kind has been made by combining the angular iron with wood, the wood being placed on the sides of the iron; and therefore I do not claim the use of iron and wood only as described.

Neither d I claim the application of wood on the sides of the iron arch.

But I do claim the application of segmental timbers on the top of the iron arch.

I claim the peculiar combination of parts constituting the arch, A, to wit, the two angle irons, c c, the spurs or double skew backs, d d, and the timbers, e, all applied and united substantially as set forth.

ARCHED TRUSSED BRIDGE—H. L. Hervey, of Quincy, Ill.: I claim, first, the use of compression braces in combination with the tension braces to support alternate bearing points.

Second, I claim the clamps with or without slots in them, or slots in the arch with or without friction rollers traversing the wedge blocks, or the equivalents of them, in combination with the truss, for the purpose of allowing the truss to rise and fall in proportion to the chamber in the arch, as set forth.

HEATING BY GAS—W. F. Shaw, of Boston, Mass.: I claim the combination and arrangement, substantially as described, of air and gas burners or distributors chambers, A' and B', and their flue and air supply conductors, F C C, the whole being made to operate together essentially as specified.

I also claim, in combination with the gas burner, the open top and closed bottom wire gauze tube, g, operating as specified.

PROJECTILES—C. T. James, of Providence, R. I.: I claim, first, the combination of a band of fibrous packing around a cannon ball with a means of distending it into the scores or rifles of the cannon (without enlarging the shot itself, as it is done where it is wholly or partially formed of flexible metal) by the pressure of the explosive gas, substantially as described.

Second, I claim the combination of a mandrel passing through the shot for the purpose of driving out the pins, with a nut for drawing it in, substantially as described.

Third, I claim the combination of a mandrel entering the shot with a ratchet or equivalent catch for holding it in place, substantially as described.

Fourth, I claim the combination of any pliable packing ring surrounding the shot, with the openings communicating between its inner surface and the chamber, where the explosive gas is generated for the purpose of communicating the power to distend such packing, substantially as described.

SEPARATING GOLD AND OTHER PRECIOUS METALS FROM FOREIGN SUBSTANCES—E. N. Kent, of New York City: I claim the employment of what I term a grain separator for separating the grains of metal from the earthy substances, or crushed gangue, substantially as described, preparatory to and in combination with the crusher, or equivalent therefor, when the separator is employed as a hopper to the crusher, and combined therewith by a feeding tube or equivalent therefor, for conducting the substances to be crushed below the column of water in the crusher, substantially as and for the purpose specified.

I claim, also, an improved chilian mill, consisting of a deep outer vessel, A, holding a high column of water, in which the double acting vertical wheels, B B, combined therewith, are wholly or nearly submerged for the purpose substantially as specified; and I wish it to be understood that I do not claim a shallow vessel in which single acting horizontal stones are used; neither do I claim the ordinary chilian mill.

LAMPS—W. M. Kimball, of Rochester, N. Y.: I claim the recess, C, operating in the manner and for the purpose, substantially as described.

DOMESTIC STEAM GENERATORS—J. T. King, of New York City: I claim the combination of a water tank, steam chamber, and steam generator, connected together in the manner and for the purpose specified, so that the hight of the water in the water tank above the orifice of the pipe leading to the steam chamber, shall always regulate the pressure of the steam, while there will be a free escape of steam as soon as the water in the tank falls below said orifice.

PERCUSSION LOCKS FOR FIRE ARMS—J. H. B. Latrobe, of Howard Co., Md.: I claim, first, the hammer chambered to receive the primer, in combination with a pusher attached to the lock plate, and protruding the primer as the hammer moves, substantially as described.

Second, also the movable cutter, in combination with the projection, on the piece, as described, to cut off the cap to be exploded, while at the same time it closes the chamber and protects the rest of the primer from the fire of the explosion, substantially as described.

Third, also the claw on the end of the detent to keep the primer always in place for protrusion.

Fourth, also the movable catch for throwing the pusher out of play, in the manner described or any other substantially the same in combination with the pusher.

Fifth, also the ferrule round the boss, in combination with the chambered hammer.

Sixth, also the twisting of the primer between the boss and pusher to permit of its being bent to suit the form of the hammer, as described.

Seventh, also the arrangement of the parts described so as to protrude the primer while the hammer is falling instead of while the piece is being cocked.

PAINTING OR VARNISHING WOVEN WIRE—W. Lincoln, of Oakham, Mass.: I claim exposing the wire work cover or articles, after having been dipped in the varnish to a powerful blast or current of air so brought to bear upon it as to pass through and clear its meshes of the liquid varnish, and pile it more on one side of each side of the wires than on the opposite side thereof, in the manner and so as to produce an effect as stated.

HORSE RAKES—Nathan Martz, of Briar Creek Township, Pa.: I claim the combination of the coiled spring, S, axle, B, rock shaft, E, and rake teeth, T, when arranged in the manner and for the purpose described.

BINDING GUIDES—J. S. McCurdy, of New York City: I claim the center piece in combination with the plates, A and B, arranged and operating substantially as set forth, for the purpose of adjusting the binder, for the use of binding of different widths, and of applying the same, with unequal lap to the material bound.

CONSTRUCTING WALLS AND FLOORS OF CELLARS—A. R. Moen, of New York City: I claim the mode described of forming walls and floors, by combining into one mass, the cement and asphaltum, by means of the stone or other suitable material, as specified, by which the asphaltum is caused perfectly to adhere to the bricks or stone of the wall, and admits the hydraulic cement, also to adhere to the same stone or brick, as described.

SEWING MACHINES—T. J. W. Robertson, of New York City: I claim the looper, b, constructed, applied, and operated substantially in the manner set forth.

DOOR SPRING—C. G. Smith, of Carbondale, Pa., I claim the use of the lever, E, in connection wite the barrel, b, and spring, c c, constructed and operated in the manner described.

BORING MACHINE—James Temple, of Birmingham, Pa.: I claim the combination of the horizontal and vertical slides, b and c, arranged and operating substantially as and for the purposes specified.

VELOCIMETERS FOR VESSELS—Ira F. Thompson, of Westerly, R. I.: I claim the gate or slide, b, actuated by the vertical weighted lever or pendulum, h, in combination with the hinged drag, b, in the manner and for the purposes specified.

MEASURING THE LENGTHS OF BRACES IN CARPENTRY—H. Whipple, of South Shaftsbury, Vt.: I do not claim determining the length of the hypothenuse and the subtended angles by a square and rule, as this has been done in several instruments.

But I claim the button, c, to receive and clamp the square on the center line of motion of said button, in the manner and for the purposes specified.

I also claim the travelor, e, with one side on the line of the slot, r, and center of the button, c, for the purposes and as specified.

HARDENING HATS—Russel Wildman, of Charlestown, Mass.: I claim the inflated elastic rubber described, constructed and operated in the manner substantially as set forth.

EXCLUDING DUST FROM R. R. CARS—Joseph Wood, of Jersey City, N. J.: I claim the employment or use of the slatted frames, c, attached to the sides of the bottom or platform of the cars, substantially as shown for the purpose specified.

BENDING SHEET METAL—J. Wright, of Hamar, Ohio: I claim the combination and arrangement, substantially as shown and described by the setting down, bending, and finishing rollers, or wheels, H i, with the table or disc, F, for operation together, and in relation thereto and each other, in the manner and as specified, one wheel, I, having a projecting ledge or bead, and for the purpose of gauging the double seam and clipping or holding it from opening, whilst being bent, essentially as set forth.

CULTIVATING PLOWS—W. E. Wyche, of Brookville, N. C.: I do not claim one or more cutters on the ordinary mold board, or the standard of a plow with a mold board on the opposite side, as these are not new.

But I claim substantially, a series of knives or cutting blades on the standard in the place of, and for dividing, cutting, and turning the furrow slice horizontally or nearly so, and depositing the pulverized soil mostly in the furrow, and turning the sod or turf upon the surface, and this I claim whether said knives be made adjustable or otherwise, substantially as described.

COFFEE POTS—Jacob M. Webb, of Sommerville, Tenn.: I do not claim a cover containing cold water for condensing the steam generated in the coffee pot, nor generally passing a stream of cold water along a condensing surface, as such are well known.

But I claim the combination of the funnel receiver, C, with its pipe, b, descending nearly to the bottom of the hollow cover, B, with said hollow cover, and with a capillary spout or orifice, d, leading from the top thereof, substantially as described, whereby a continual and self-regulating flow of cold water is conducted along the condensing surface in the manner set forth.

HYDRAULIC METER—John S. Barden, of New Haven, Conn. (assignor to himself and A. W. Rockwood): I claim a partitioned hollow cylinder or chamber and two series of induction or eduction passages, arranged with respect to the partition of said chamber, substantially as described, in combination with three or any other suitable number of oscillating cylinders and pistons connected together and applied to the partitioned cylinder and made to operate essentially as explained, and for the purpose of receiving and discharging water or any other fluid, and measuring the same, as set forth.

I also claim combining each oscillating cylinder with the partitioned cylinder by a yoke, screw bolts, and pressure springs, or their mechanical equivalents, arranged and operating together, substantially in manner and for the purpose as set forth.

I also claim making the bottom of each cylinder dishing or concave below the lower terminus of the path of the piston, and towards the passage of said bottom as specified, the same being for the purpose as set forth.

ROACH TRAPS—J. Goodyear and T. J. Berry, of Philadelphia, Pa. (assignors to themselves and Wm. Foster, of Carlisle, Pa.): We do not claim the falls, tubes or boxes, separately considered, nor do we confine our claim to the precise form and construction of the body of the trap, nor to the precise number or form of the tubes and falls, as these may be varied to suit circumstances.

But we claim the tubes, C C, and the falls, B or B', when the same are arranged and operated together, substantially in the manner and for the purpose set forth and described.

WHEELWRIGHT MACHINE—C. H Guard, (assignor to J. A. Scroggs and C. H. Guard,) of Brownsville, N. Y.: I claim the combination of the boring and mortising shafts, C C, with the levers, E' E', through the medium of the toothed saddles, I I, the toothed segments, H H, and the oscillating shafts, D D', or their equivalents, substantially in the manner and for the purpose set forth.

OPERATING THE VALVES OF STEAM ENGINES—John Scheitlin, (assignor to himself and Oliver A. Dailey,) of Washington, D. C.: I claim the four teeth cylinder, B, keyed on the main driving or crank shaft, A, the maltese cross, C, with its shaft, H, and the small crank, C', keyed thereto, said cross, by means of the feather, f, or any equivalent device being susceptible of a free and steady to-and-fro motion along whilst driving its shaft, H, not being so moved by the rack and pinion, D, a screw or other equivalent means, and by which also it can be retained on its shaft, H, in any desired position in relation to the cylinder, the whole being arranged, connected, and operated substantially as set forth, whereby a single steam valve of a steam engine can be worked either as a feed valve, or as a feed and as a cut off valve alternately, and the steam cut off at any required point of the stroke whilst the engine is in operation.

SAWING MACHINE—Wm. P. Wood, (assignor to himself and J. S. Gallaher,) of Washington, D. C.: I claim attaching two saws to the opposite ends of two parallel rocking beams by means of swivel bearings, and in combination with the mode of straining, substantially as described.

I also claim, in combination with the saw table and upright or column, the reversible graduated scale gauge, W W, as set forth.

RE-ISSUES.

SEWING MACHINES—WM. H. Johnson, of Granville, Mass. Originally patented March 7, 1854: I claim, first, the making of a seam with a single thread, by the combination of a single needle, forked hook and expanding lever, operating substantially in the manner and for the purposes specified.

Second, the forming or making of a seam from a single thread by the running of a loop of the thread through the material to be sown, the running of a second loop through the material, and putting the first loop through the second, the running of a third loop through the material and through the first named loop, the carrying of a fourth loop through the material, and then putting the third loop through it and so on, putting the first loop through the second and around the third, the third loop through the fourth and around the fifth, and so on, forming the belaying double loop stitch, described, in the manner set forth.

Third, the feeding of the material to be sewn by means of a vibrating piercing instrument, whether said needle be the instrument itself or an independent instrument in the immediate vicinity thereof, substantially as described.

GAS CONSUMERS—David Matthews, of Philadelphia, Pa. Patented orginally Feb. 20, 1849. Re-issued Oct. 4, 1853: I claim the combination of the receiving case shield plate or head and filter with and over the top and sectional chimney with the enlarged base and smaller section in the smoke box to convey off and arrest the sparks without pernicious effect, as described.

Also I claim increasing the base of the chimney beyond the diameter of the upper end of the section extending vertically to near the lower horizontal flues and bottom of the smoke box to aid in the generation of steam as described.

Also I claim the trumpet-mouthed tube over the chimney, said tube being divided into two or more parts, to collect sparks and direct them inwardly by aid of the opening between said parts, as described.

Also I claim the manner in which I connect the case at the top of the chimney with the furnace or fire box by means of the pipes or tubes, G G and H, cases, L L, and the openings thence into the fire box or furnace to carry the sparks and gas to the furnace to be consumed, as described.

ADDITIONAL IMPROVEMENT

GRINDING MILLS—A. Felton, of Troy, N. Y. Patented originally Jan. 2, 1855. Re-issued Jan, 29, 1856: I claim in combination with the cylinder concave and spiral ribs, the cracking or crushing apparatus preceding the grinding surfaces for the purpose of adapting the mill to the grinding of corn and the cobs or other similar material, as set forth.

Foreign Scientific Notes.

THE DIVINING ROD—The London *Mining Journal* states that the Rev. A. Suckling, recently delivered a lecture at the St. Helliers, Jersey, on the "history, antiquity, and correct principles of the 'dowsing' rod, for the discovery of minerals, metals, and springs of water below the surface of the earth." Mr. Suckling stated that he was convinced there existed a certain, though inexplicable, affinity between the effects of operations with the divining rod and what, in our present modern designation, is termed "mesmerism;" that he refers them to one and the same source. It was then attempted to be shown that mesmerism was known to the ancient Egyptians, and that many anecdotes and passages of Scripture show that it was well understood among the entire population of Asia. To this principle is ascribed the application of Naaman, captain of the host of Syria, to obtain a cure for his leprosy, and the interview of Saul with the Witch of Endor. In the course of the lecture it was stated that many of the wells in the island had been discovered by himself and others, endowed with the peculiar power which was said to appertain only to certain persons.

DISTANCE OF THE SUN FROM THE EARTH INCREASING—Some German papers are endeavoring to prove that the distance between the earth and the sun is increasing annually, and argue from it that the increasing humidity of some summers and the loss of fertility by the earth, are to be attributed to this circumstance.

In the course of six thousand years from the present time, they absurdly assume the distance will be so great that only an eighth part of the warmth we now enjoy from the sun will be communicated to the earth, and it will then be covered with eternal ice, in the same manner as we now see the plains of the North, where the elephant formerly lived, and have neither spring nor autumn.

ENGRAVING MACHINE—A number of our exchanges have recently given wide circulation to the following paragraph:—

"M. Barrere, a French inventor, has exhibited a machine which engraves lines so minute as to be undistinguishable and almost imperceptible to the naked eye. It is designed for the production of private marks in bank notes, and is capable of producing two hundred different combination of minute kaleidescopic line figures, only to be seen by the aid of a powerful microscope, yet perfectly regular and distinct, and unsusceptible of being imitated. At every turn of the tiny wheels which work it, the machine produces four entirely new designs, exceedingly complicated, and quite different from one another."

This machine is of American origin, and is the invention of J. Bogardus, of this city, and work executed by it, as described above, has been on exhibition in this city for fifteen years.

HOW TO MAKE A FIRE IN A COMMON GRATE.—A correspondent of the London *Builder* thus describes a new method of burning bituminous coals in a parlor grate:—

"Clean out your grate, and cover the bottom with a sheet of paper folded to fit; then place the coals in the grate to the level of the top bar. The fire is then to be lighted on the top and allowed to burn downwards."

It is stated that this plan of burning bituminous coal saves a great deal of fuel, and makes a cheerful brilliant fire. The theory of this saving consists in the gases arising from the fresh coals below having to pass through the fire, where they are consumed, and thus give out heat in combustion, at the same time preventing smoke.

CHEMISTRY AND MATERIALISM.—The renowned Liebig delivered a public lecture on "Animal Chemistry" at Munich, on the 19th of Jan., in which he took occasion to declare, from his position as chemist and naturalist, his opposition to the widely-spread views of Moleschott, Vogt, Buchner, and others of the most rugged materialism. He pronounced himself with dignity and energy against the "deniers of mind and vital power," and illustrated and combatted, from his profound conviction, their erronous theories on pure scientific ground. He showed how impossible it is to explain on chemical principles the existence of even the lowest connecting parts of an organism—of a cell or a muscular fiber—and how much more so to account for the mysterious processes of life and thinking by a change of matter. He demonstrated how unable materialists were to distinguish organic combinations from those purely chemical. Nothing, he said, was more absurd than to derive the process of thinking and willing from a phosphorescence of the brain, as Moleschott had done. How much more of thinking stuff, then, (material of thinking,) would there be contained in bones, which have four hundred times more phosphorus than the brain?

Coal in a Curious Place.

A correspondent of the Philadelphia *Ledger* states, he has examined coal at the tunnel on the North Pennsylvania railroad, in a situation never before known to geologists. It is found fron 30 to 60 feet below the surface in rock of horn blende. The coal is confined in cracks of the rock, which diminishes in width (which is only a few inches) towards the top. He believes this coal was ejected from below, and that it is proof against the prevalent opinion of geologists, that coal is of vegetable origin.

Is he sure that it is coal? It may be a carbon shale, and not true coal.

The small bug which fell on the snow at Alexandria, Va., on Jan. 12th, has been discovered to be the black cochineal bug of Mexico. These were, no doubt, carried by a hurricane from Mexico.

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(Our Foreign Correspondence.)

How They Make Maccaroni.

NAPLES, Italy, Jan. 20, 1856.

MESSRS. EDITORS—I have already shown you that "labor-saving" machinery is very little used in the Italian States; but I believe I have never attempted to describe any of the mechanism these people employ when they wish to produce results that cannot be obtained by manual dexterity. As a sample, I will give you a description of a "Maccaroni Factory" which I entered in the course of a visit to Pompeii, a few days since. On entering the establishment we first witnessed the sifting of the flour—a kind of coarse, yellow meal—which looked so much like Yankee corn meal that I could not be satisfied to the contrary until I was shown the wheat, and saw it undergo the grinding process in one of the hand *machtnes* used for the purpose, namely, a huge pestle and mortar. After the grain had been pounded into a coarse bran it was poured into large round sack bottomed sieves suspended from the ceiling, which were shaken by a man, who, from time to time, skimmed off the "rough," while the flour fell upon a cloth laid upon the floor; from this cloth the flour was carried to a large wooden trough, and mixed with warm water to a sticking consistency. The "cake" was then transferred to the kneading contrivance, where it was placed on a platform raised a couple of feet from the floor. At one corner of this platform a long pole was attached by a movable joint, and laid horizontally across the platform. Boys setting or hanging upon the other end of the pole sprung it up and down upon the dough until the substance was kneaded and compressed sufficiently to spread out and roll up into the size required for the screw press, which is the next piece of machinery used in the process of making maccaroni.

The press is, in itself, quite a curiosity. Two upright posts are firmly fastened into the ground and ceiling; near the center is a stout cross bar, in which a large copper screw works, eight inches in diameter, with an en larged head, similar to the top of a capstan. A short distance below is another cross bar, in the center of which a hole has been bored to receive the mold, which is a strong copper cup or vessel having numerous small holes in its bottom, each hole being partially filled by a piece of wire. The dough is now placed in the mold and pressure applied by several men, who turn the screw with a long wooden bar. This forces the dough through the holes in the bottom of the mold, the wires giving it a tubular form so characteristic of all maccaroni's. As the "screwing process" is repeated, wooden blocks of the proper size are alternately placed in the mold on top of the dough, until it has all been squeezed through the mold. The dough issues from the mold in small stringy tubes, and a boy with a large palm leaf fan is employed in keeping the strings cool as they protrude. From time to time he cuts them off into the proper length, by means of a knife attached to the bottom of the machine. As fast as this boy cuts off the strings he hands them to other boys, who arrange them upon long poles placed in frames set out in an open court-yard. Here they are exposed to the action of the sun and air, and in a few days these tubes of paste become almost imperishable articles of food.

As maccaroni forms the chief "feed" for the lower classes in Italy, I am surprised that more expeditious machinery is not employed in its manufacture. I do not doubt but an inventive Yankee would reap a golden harvest if he brought some kind of a small machine out here that would enable every family to make its own maccaroni. At present the population of an entire city thrives upon the production of this article, while hundreds of the neighboring farmers bring in their grain, receiving the manufactured paste in payment.

J. P. B.

The Way to Keep a Razor Sharp.

A correspondent informs us, that after trying "strops" innumerable, to keep his razor sharp—he having a heavy beard, and has cut it from 3 to 7 times per week for 30 years, often suffering great pain—has at last found a complete remedy, in what? An Arkansas oil stone (Arkansite.)

Three years ago, a friend of his gave him one of these stones; it was so fine in the grain hat he tried his razor on it, then used it without *stropping*, and has so used it ever since—never allowing it to touch a strop. "Shaving," he says, "is now a luxury;" a few strokes on his "Arkansite" never fails to set his razor right when it becomes dull, and he feels sure it is the best method of keeping it sharp. Acids and razor strops he now puts beyond the pale of civilized razordom, for keeping the edge sharp.

(For the Scientific American.)

Alder Flowers, Oak Bark, Swamp Maple, and Tartar in Dyeing Colors.

MESSRS. EDITORS—In your paper of the 2d of February you state "that Piesse Dupierre, of Paris, has obtained a patent for the employment of alder flowers to form a substitute for cream of tartar in dyeing black and other colors."

That alder flowers and the bark of alder are valuable materials in dyeing black is nothing new, for between the years 1796 to 1805 I used many tuns of them in black dyeing. When a supply could not be obtained I used white oak saw-dust, which I found to produce a still better effect. Any material containing gallic acid and tanning principle can be used to advantage in black dyeing. In this country, during the last English war, I used our swamp maple bark with better effect than the alder. Three pounds of ground maple bark is equal to one pound of nut-gall.

Cream of tartar is used in a given range of bright colors, such as scarlet, orange, aurora, yellows, crimson, purple, violet, &c., for the purpose of imparting to them great brilliancy. It is used with either muriate or nitro-muriate of tin. The nitric and muriatic acids having a greater affinity for potash then the tartaric combines with it, liberates the tartaric acid, which combines with tin, forming in the liquor a tartrite of tin, which gives great brilliancy to coloring matters. How the gallic acid and tanning principle, both possessing powerful saddening qualities, and precipitating tin instead of combining with it, can be used in place of the tartaric, is to me very unaccountable. It is well known by experienced dyers that cream of tartar is never used in black dyeing, as it operates as a check on saddening. Both the gallic and tartaric acids are triple compounds of the same elements, hydrogen, carbon, and oxygen, but varying materially in their proportions, tartaric containing forty per cent. less hydrogen, twenty less carbon, and sixty per cent. more oxygen. Perhaps M. Pierre Dupierre may have some cheap magic process by which he can change the components of the gallic into the tartaric.

WM. PARTRIDGE.

Binghamton, N. Y., Feb. 18, 1856.

Flour and Bread, Bakers, Millers, &c.

MESSRS. EDITORS—Wheat sown in the fall will produce grain much heavier than the same seed sown in the spring; and one hundred pounds of winter wheat flour will make more and better bread than one hundred pounds of flour made from spring wheat.

Millers find it economical to use large stones in grinding; but large stones injure the quality of the flour. No mill-stone should be over three feet in diameter; flour from such a stone will make more and better bread than flour made from a five foot stone; so that 100 pounds of winter wheat ground with 3 foot stones, and baked by a regular baker with the drugs and chemicals at present used, will make 170 pounds of good bread. 100 pounds of the same description of flour baked as women bake for their families will make 140 pounds of good bread. 100 pounds of bad flour, baked as women bake for their families, will make 100 pounds of pretty good bread. By bad flour I do not mean flour which has received any damage from heat or damp, or from any other cause; but I mean sound spring wheat, nicely and finely ground with large stones, 5 feet or more in diameter—flour that almost any one except master bakers, would pronounce to be "superfine, A, No. 1."

One pound of dough, if baked in an oven in *pans*, will make one pound of bread, nice large sweet bread, and almost entirely devoid of nutritous qualifications, useful principally as a kind of vehicle to transport butter into the human stomach. One pound of dough baked on the bricks on the bottom of the oven will lose 2 or 3 ounces in weight in baking, and will not look so nice, but it will be sixty per cent. more nutritious than the same amount of dough baked in the pan.

This statement in relatian to baking in pans and on the bottom of the oven may seem incredible to most people, and I would advise all persons not to believe what I have stated until they choose to try the experiment themselves.

In the army we had issued to us every morning sixteen ounces of bread; those that got their ration in pan bread would eat it all for their breakfast, and hardly be able to know what had become of it; while those that got their ration of oven bottom baked bread would have enough for breakfast, dinner, and sometimes a little for supper.

If good flour in barrels be stored in the same room with barrels of salt or salted provisions in warm weather, in three or four weeks the flour will become sour, but if it be then taken into a dry building where there is no salt or salted stores, the flour will become regenerated and will make good bread.

When the flour is dry and not musty, and a baker wishes to judge of its quality in his own shop, he squeezes a handful of it tight, and if, on opening it, the flour retains the shape of the hand and fingers, it is a sign that it possesses the good qualities I have mentioned above; if it crumble down on opening the hand, it will not make as much nor as good bread. When a baker is inspecting flour, not in his own shop, or in the presence of outsiders, he takes a handful carelessly, squeezes it tight, and then throws it back into the barrel; if the lump keeps its shape, or breaks only into two or three pieces, he will buy it; if, on the contrary, it goes into fine powder, he will not have it, because it will not make much nor good bread.

T. ROYAL.

Bridgeton, Pa.

The Cotton Gin.

MESSRS. EDITORS—My object in writing my letter published on page 94 SCIENTIFIC AMERICAN, was to draw out something of public utility from any one familiar with the cotton gin; this in part has been accomplished.

In replying to the letter on page 131, which was an answer to mine, its author has written me a friendly letter, and is desirous of eliciting anything that may be of service to the public. Mr. Brown has also informed me that his saws were arranged for ginning the Sea Island Cotton. I therefore take pleasure in removing any unfavorable impression that may have obtained against his gin by my remarks respecting the staple reaching over more than one saw at the same time, as I did not intend them to apply to any but the upland or short staple cotton. In my first letter it was admitted that the fiber might be cut by an imperfectly made or badly regulated gin. The only way in which the fiber can be cut is by pressure of the saws against one side of the rib, acting like a pair of shears, as in the case of crooked or imperfectly trained saws in the first place; or in the second, by the ginners neglecting to keep the saws in the center of spaces between the ribs. If this be the true theory, then every form of saw gin, from W. Whitney's down to the present, is liable to cut in the aforesaid manner, and yet the perfectly made saw gin, according to my first statement, is exempted from the charges made against it.

If the old gin of Whitney, now in Georgia, makes finer cotton than those now in use, I presume it is not because there has been no improvement in the gins of the present day, but, possibly, because of its taking but little hold of the fiber at one time, and ginning very slow, a thing that will not do for this progressive age, wherein the planter wishes the gin to keep up in speed with the increase of his hands and enlargement of his field.

JOHN DUBOIS.

Greensboro, Ala.

The Chinese Yam.

This new esculent, respecting which so much has been said and written as being a valuable substitute for the potato, has been cultivated by W. R. Prince & Co., Flushing, L. I.—celebrated florists—who have issued a pamphlet describing its nature, and the method of cultivating it. In our opinion, this yam is no better than other yams; and we beneve it will never answer as a substitute for, nor supersede the common potato, as has been asserted by some.

Mechanical Equivalents in Law.

MESSRS. EDITORS—What is a "mechanical equivalent?" I know what an equivalent is, and I have some idea of the term as applied to mechanics, but what I desire to know is—what construction would be given to it by a court? I find among inventors a wide difference of opinion on this point, and a great anxiety to have it settled. To illustrate:—On the 3rd of Jan., 1854, a patent was granted to J. B. Terry, assignee of Harvey, for an improvement in pin-sticking machinery, "which improvement consists in a slide for taking one row of pins from the conductors, and delivering them to the forceps for sticking them."

"The claim is for allowing one pin at a time to pass down the conductors by means of a vibrating slide, or its mechanical equivalent, so as to supply one row of pins at a time by the conductors to the forceps."

Now I am told by one man that any means by which one row of pins is allowed to pass down the conductors at a time is an infringement of this patent, and by another that an infringement would consist only of a vibrating slide made and operated in a manner substantially like this. Others say that any device embracing the same or similar mechanical principles in its construction and operation would be an infringement. Please enlighten your readers on this point, and oblige, at least.

A. F. O.

Cohoes, N. Y.

(The first question presented to us in the case cited, is not, "what is a mechanical equivalent," but "what is the thing distinctly claimed as new in the patent." In patents for improvements on machinery, the claim, or claims, only embrace the device (or devices) that accomplish a new and useful result, or an old result in a superior manner. Having therefore, a clear idea of the thing or things claimed, it will not be so difficult to decide upon the question "what is its equivalent?" In the case cited, if the claim is simply for the slide, as constructed, then any similar device is an equivalent. If the claim is for *the method* of allowing only one row of pins to pass at once to the conductor, then any *similar method* to produce a like result, is an equivalent. A *method* in a machine may embrace one or more devices, but devices it must embrace; and it is upon the similarity of these that mechanical experts are called upon as witnesses, to give opinions in patent trials. In trials for infringement of patents on complex machines, it is sometimes difficult to decide upon *equivalents*, especially when the thing claimed relates to a result produced by a combination of devices. Such an equivalent is not that of a simple device, but a number of them, and these arranged in a peculiar manner. A wheel on a shaft connected eccentrically with the rod of a piston in a steam cylinder, will give rotary motion to the shaft, just like a crank, or an eccentric plate with a strap round its edge—these are all mechanical equivalents for giving rotary motion to the shaft, but who would decide that James Watt's "sun and planet" wheels to accomplish the same result, was a mechanical equivalent? No good mechanic.

The claim of Mr. Terry will be found on page 139, Vol. 9, SCIENTIFIC AMERICAN, and it embraces *a combination of devices* to accomplish a certain result.

Pension for Propeller Improvements

The British Government has granted a pension of £200 per annum to F. P. Smith, in consideration of the efforts made by him, and the expense he incurred in the introduction of the screw propeller into the British Navy and mercantile marine. The screw has completely superseded the paddle wheel in the Navy, and the whole war fleet of that nation is now almost exclusively composed of screw steamers. If F. P. Smith had been some Lord's son, he would have received a pension of thousands, instead of hundreds of pounds. Two hundred pounds is a paltry sum, indeed.

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New Inventions.

Time Ball Signals.

The custom of dropping a ball accurately at a given time has been adopted and carried out at the Royal Observatory at Greenwich, London, for many years, for the purpose of enabling outward bound shipmasters to determine the error of their chronometers before leaving port. Within two or three years the American method of chronographic observation has been introduced at Greenwich, and in connection with this, the great clock of the Observatory has been made to drop the ball automatically by a telegraphic signal.

A similar ball has been since arranged at Liverpool, and the Greenwich Observatory clock distributes time signals to various points in the city of London, and over all the chief lines of railroad and telegraph which diverge from the British Metropolis.

No such apparatus exists at present in America, and the only approach to it is the ball upon the U. S. Naval Observatory at Washington, which is thrown down by hand at the word of command. The great commercial port of New York not merely has no precise signal for the regulation of chronometers, but is dependent upon private resources for a knowledge of the time by which the clocks are to be regulated.

In view of this Prof. Bache, of the Coast Survey, and Prof. Gould, of the Dudley Observatory, at Albany, N. Y., have sent a message to the Mayor expressing a desire to supply New York with time, which they offer to be accurate to the tenth of a second. This would be of great advantage to the shipping of the port. The plan to be carried out in this city will be the dropping of a large and conspicuous ball, or giving some equivalent signal in one or more points in the city; and secondly, to regulate any clocks which the City Government may select, by means of the same telegraphic circuit. The necessary annual expense will be confined to the small sum needed for the care of the apparatus, and for the renewal of the batteries. The Dudley Observatory asks for no remuneration, and the requisite apparatus will be far from costly.

We hope our city authorities will accept the kind and generous offer, and provide means to carry out this correct time signaling, as soon as the Dudley Observatory gets into full operation, which will be about August next.

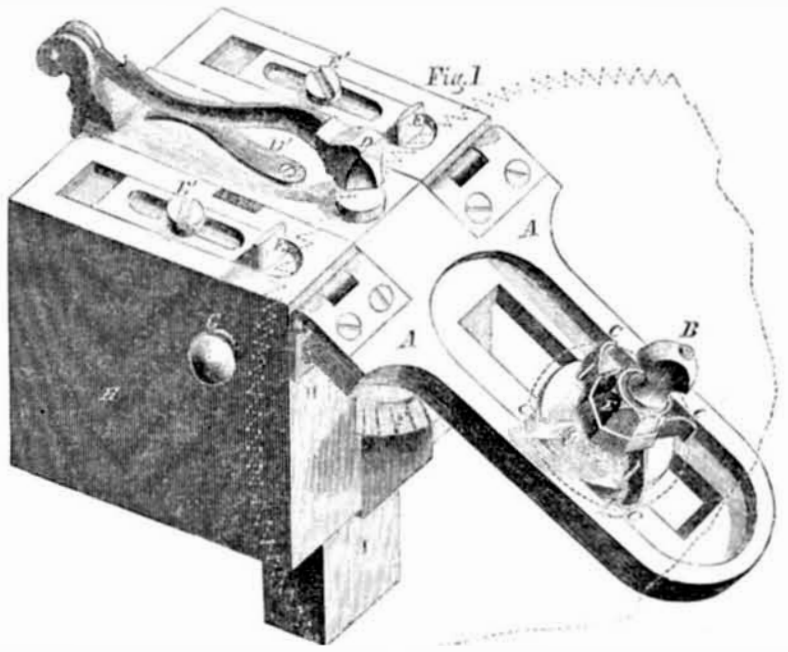
The French Imperial Cradle.

A Paris letter in the *Independance*, of Brussels, states that the municipal authorities of Paris have given orders for a magnificent cradle to be got ready for the expected infant of the Emperor and Empress of France. It will surpass, it is said, in taste and exquisite workmanship, the famous one presented to the King of Rome. The following is a brief description of the work in question:—

It will be in the form of a boat—the principal emblem in the arms of the city of Paris. At the prow will be a silver eagle, with outspread wings, and the curtains at the head will be supported by an imperial crown, also in silver, held up by two children, one wearing a helmet, and the other bearing round its head an olive branch, emblematical of peace. The body of the cradle stands on two columns, one at the head and the other at the foot, and united by a rail beneath. The columns will be in rosewood, beautifully carved and ornamented with foliage in silver. The upper edge of the cradle will have a border of silver filagree work, having on either side, about the middle, small escutcheons in silver bearing the initials of their Majesties. From these medallions garlands of flowers in silver will lead to the foot and head of the cradle. The curtains will be of point d'Alençon lace and blue silk, embroidered in gold. The composition, direction, and superintendence of this beautiful piece of workmanship has been confided to M. Baltard, the architect of the city of Paris.

[Magnificent as the above cradle promises to be it would be rendered still more *recherche* by the introduction of some of our Yankee improvements. For example, there is the Horological Cradle, invented by David Walker, of Newark, N. J., which swings the rising generation into slumber by means of clock-work, and effects a vast saving in maternal care and labor. These cradles are very extensively used. Then there is the Musical Cradle of Mr. L. F. Whitaker, of Raleigh, N. C., which is not only swung by machinery but also sends forth sweet sounds of music. Both of these inventions are illustrated in Vol. 6 of the SCIENTIFIC AMERICAN. The propelling mechanism occupies so little space that it might easily be concealed beneath the gilt and carvings of the Imperial boat. Will not the French authorities send an order to our ingenious countrymen?

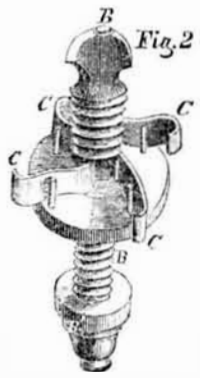
IMPROVED SAW SET.



Saw Set or Circular Saws.

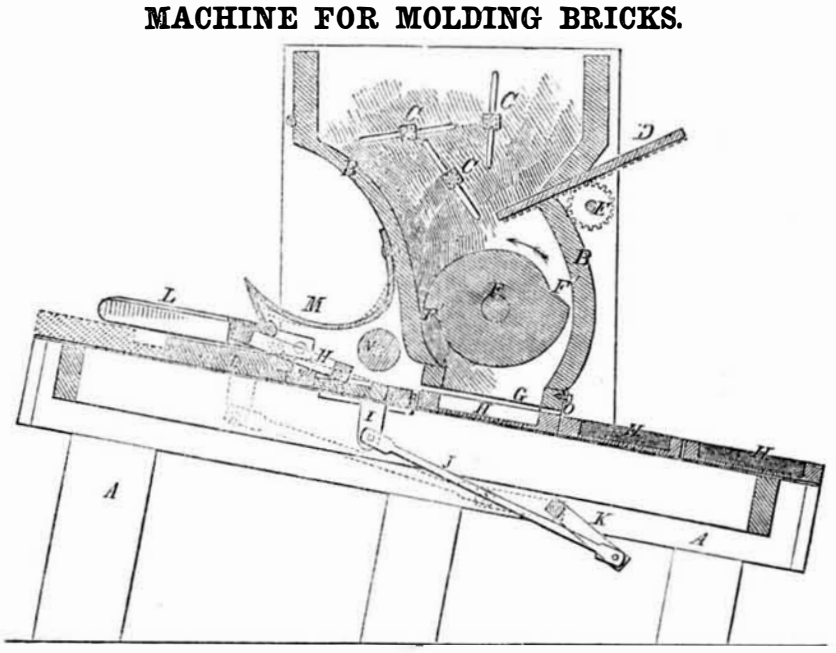
In the invention illustrated by the accompanying engravings the saw is secured upon the inclined hinged leaf, A, by means of the screw, B, which passes through the center of the saw. The leaf, A, it will be observed, is slotted, so that the screw, B, can be moved to accommodate different sized saws. The screw, B, is furnished with expanding arms, C, which are hinged to the body of the screw, so that the arms are expanded or contracted, according to the direction in which the screw is turned. The office of the arms is to touch upon the inner edges of the arbor hole of the saw, and thus form a pivot upon which the saw is revolved; the arms are made to expand in order to suit different sized arbor holes. E is a nut that screws down upon the arms, C, and holds them in any given position. In fig. 2, the nut, E, is removed so as to show the arms, C, very plainly. B′ is another nut on the lower end of screw, B, that binds the latter and its appurtenances, to the leaf, A. The saw being revolved by hand, its teeth are brought, one by one, beneath the hammer D, and set by a blow upon the hammer, in the usual manner. D′ is a spring that lifts the hammer again, when it is struck down. The guides, E, are rendered adjustable by means of set screws, E′. The inclination of the leaf, A, is adjusted by means of the screw piece, F, which is operated by the thumb screw, G. The various parts of the apparatus are attached to a square block of wood, H, furnished with a plug, I, to fit into a bench or stand.

We have described this instrument as applied to the setting of circular saws, but it is equally well adapted to the straight saws. All that is necessary to fit it for the latter is the substitution of a screw furnished with a straight rest in place of the screw B.



The cheapness and simplicity of this invention, and its convenient adaptation to the setting of both circular and straight saws, ought to insure for it a very extensive introduction. It is the invention of John G. Ernst, of York, Pa., of whom further information can be obtained. His patent bears date Feb. 5th, 1856.

MACHINE FOR MOLDING BRICKS.



Improved Brick Machine.

The frame, A, stands on an incline, as shown in the engraving. The clay is thrown into the upper part of box B, where it is suitably mixed by the pugs C, which revolve in the usual manner. D is a slide which divides the box and prevents the clay from falling below into the molds before it is properly prepared. The slide is operated by pinion E. The clay falls upon the pressing wheel, F, which revolves in the direction of the arrow. The pressing wheel, it will be observed, is cam shaped, the projections, F′, serving to catch the clay and force it down through the grate bars, G, into the molds, H. The empty molds are fed in at the left end of the machine where they are placed on a reciprocating bed, I, which is made to move back and forth by means of the pitman and crank, J and K. The side spring hooks, L, serve to hold the molds during the back action of the bed, I. Spring M also assists for the same purpose, and causes the mold to fall down on to the bed at the proper moment. N is a friction roller, beneath which the molds pass, and are held down as they approach the bars G. Arrived beneath the pressing rolling roller, F, the mold remains long enough to be filled, when it is immediately pushed forward by an empty mold coming from behind. At O there is a scraper, which smooths off the filled molds. The filled molds are removed at the right or lower end of the machine.

This apparatus is simple, and apparently very rapid and effective. We are told that its cost of construction is quite small, that it cannot easily get out of order, and that the quality of the work it accomplishes is the very best. A single machine, we are informed, will mold 100,000 bricks per day. The pressing roller, F, it should be noticed, just fills the box, B, and therefore can never choke up, although the exact quantity of clay necessary to fill a mold will invariably be carried down. Two molds are filled at each revolution of the pressing roller.

The above improvement is the invention of Mr. Richard W. Jones, of Green Castle, Ind., and was patented by him Jan. 15, 1856. He will be happy to furnish further information, by letter or otherwise, to all who desire it.

Breaking of Railway Car Axles.

On page 166, we copied the views of A. Lindsay, on the cause of railroad car axles breaking off at the hub. He attributed this to the carbonizing of the metal by heat, and the imbibing of the carbon of oil—strange ideas certainly. A correspondent, A. C. Ketchum, of N. Y. City, adopting the more general opinion, asserts that railroad car axles become crystalline and brittle at the hub, from straining and concussions, and that these actions affect axles in the same manner that the twisting of a piece of wire affects it, namely, rendering it easy to break. The weight of the car is placed upon the extremities of the axles, therefore, in turning curves, the hub is the fulcrum, and the axle therefore is subjected to a kind of twisting action at that point.

Scott Russell Failed.

The late news from Europe contains intelligence of the failure in business of Scott Russell & Co., of Millwall, London, with liabilities amounting to nearly a million of dollars.—The leviathan steamship, 700 feet long, and over 10,000 tuns burden, was building at the works of Messrs. Russell, and we are of opinion that this vessel is the cause of their failure, for they were large stockholders.—We hope the building and fitting of this vessel will not be suspended, but we are afraid the good people of Portland, Me., who have lately voted $60,000 to prepare a dock for her, as one of the traders to their city, will have to wait a long time before they see it. Scott Russell is an eminent scientific engineer, and possesses a bold and original genius, we therefore regret his failure in business. The most difficult part of the hull of this Leviathan is finished, and the engines and boilers are in a very forward condition, and preparations of stupendous magnitude had been in progress for the anxious day of launching.

What are called "self-sealing envelopes" have been found more unsafe than wafers for enclosing letters, so far as it relates to their adhesive qualities. They have been opened and re-closed by postmasters in England, and no person could tell this had been done from their appearance. The adhesive substance used is "disastaste," or flour gum.

Six drops of the chloride of soda in a wine glass full of cold spring water, is excellent for washing the mouth before going to bed, and after breakfast, to remove offensive odor caused by decaying teeth.

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Scientific American.

NEW-YORK, MARCH 8, 1856.

Remarks on the Report of the Commissioner of Patents.

The Report of Judge Mason, which was published in the two previous numbers of the SCIENTIFIC AMERICAN, deserves the serious consideration, not only of every inventor, but every citizen in our country. It is an eloquent, elaborate, and original document. The rapid increase in patent business during the past ten years, is graphically described by stern and incontrovertible rows of figures. In 1845, 1,246 applications for patents were made, 502 were granted; $51,076·14 were received, and $39,395·65 were expended. In 1855, 4,435 applications were made, 2,024 granted, $176,380·57 received, and $179,540·33 expended. There has therefore been a quadruple increase of inventions in ten years. During the past year the expenses of the P. O. have exceeded the income by $3,159·76. These have been incurred for payment of the increased force of examiners and clerks in the Office, for the purpose of making examinations, and executing the business promptly Applicants for patents have not been obliged to wait in suspense for six, ten, and twelve months before their applications were acted upon, as was the case formerly; their applications were acted upon within a few weeks, generally, after they were presented. This has given universal satisfaction; and as the Office cannot go on and do its business correctly and promptly, with an expenditure constantly exceeding its income, our inventors will respond heartily to any reasonable increase in patent fees, for the continued proper and prompt execution of business by the Office. The Commissioner suggests the increasing of the revenue, and charging applicants fees according to the work performed; that is to have a *sliding scale* of prices for examinations. This would be the most just method, but also the most difficult to carry out, unless the scale of fees was rated by the number of words in a specification, or the pages of parchment it occupied—which is according to the English plan of drawing up such documents. The more simple plan for increasing the revenue would be the increase of the patent fee to $40—ten dollars more than the present fee. According to the number of patents granted last year, such an increase of the fee would have exceeded the expenditures by $17,081.

In discussing the evils arising from the want of system and harmony, in deciding upon applications for patents by the different examiners, Judge Mason seems to feel that injustice may have been done to many inventors by rejecting their applications without just and proper reasons. He therefore suggests the creation of a new officer, that of an Examiner in-Chief, whose duty it shall be to review the decisions of all the examiners; or else to have three such officers to form a court, to decide upon difficult and disputed cases. This suggestion appears to be a good one, but Judge Mason is of opinion that it would be very difficult to get persons capable of filling such an office. He says truly, "there is no situation under government for which it would be more difficult to find a suitable incumbent."

The Commissioner also discusses the returning to the old plan of issuing patents without an examination—the office of examiner being only advisory. We cannot entertain the idea of a return to this system upon any consideration. It would open a door for the granting of two or more patents for the very same invention, and the owners of these would so inflict and disgust the community with their claims, criminations, and recriminations, that patent property would very soon become almost valueless.

We cannot agree with Judge Mason in the views which he presents relating to what may be called "the property of inventions." He places an invention on the same basis as the property of real estate, a piece of goods, or crop of grain produced by labor. The rights of inventors to their inventions, he considers, should be perpetual in them and their heirs, as a *natural* right, and the only argument presented in favor of the law limiting patents to a certain number of years, is *expediency*. We could not advocate the abrogation of any *natural* right upon the principle of expediency.—The logical mistake in the Report, as it appears to us, consists in viewing the granting of patents for discoveries, as the conferring of natural rights upon inventors. A patent confers no natural right upon any man. If the law of patents were abolished to-morrow, no man would be deprived of a *natural* right thereby. Every man could invent and use his own machine without let or hindrance, and the common law of the land would protect him in this use. The property of inventions as recognised and provided for by the law of patents, is simply *legal*. J. W. Scott in his opinion in the patent suit of Goodyear versus Day, dated at New Brunswick, N. J., Dec. 13, 1852, clearly explains the nature of patent property. He says "a patent right is strictly legal; it has not one of the characters of *rights equitable*; it is not the right of possession. It is the right of exclusion for a definite period of time, and it is the grant of exclusion by sovereignty and by force of positive statute.' Again he says, "some assert that by the law of Nature, the creature of a man's brain is as much his individual property as the work of his hands, and that the wild Indian who builds his wigwam in the forest, and the bird that suspends her nest from the branch, have each acquired, and do acquire, a title in nature of which it is unjust to deprive them." . . . "Is it worth our time or breath to ask the question, does the bird in the one case, or the savage in the other, acquire any right in nature to prevent others from imitating the nest or the wigwam? The right is exclusively and strictly legal. It is the creature of positive law; its duration is but for a short time, or it could not be endured by a free people."

Were patent property, based on *natural* right, the Woodworth monopoly ought to be continued forever. If it were a *natural* right, it would be wrong in us to oppose its extension—we could not do it conscientiously. Patent property is peculiar in its nature. In a certain sense it is *ideal*, and is totally different in essence from all other kinds of property, excepting that of the copyright in books, which is also legal, and which it resembles in most respects. No class of men have done more to benefit mankind, and advance civilization, than inventors; and patent laws have been enacted as a politic positive means of affording them some remuneration for their gifts to mankind. To fall back on the principles of *natural right*, in relation to inventions, would involve the abolition of our patent laws,—the only positive means yet provided by modern civilized nations for rewarding their inventors.

It affords us great pleasure to witness the hearty and noble sentiments uttered by Judge Mason in advocating a reduction of patent fees for foreigners. Every new and useful improvement introduced into our country—let it come from where it may—is a positive benefit to our people; it is an additional weight placed on that Archimedean lever which is elevating our race. It is a wise and honorable policy to invest the authors of them with legal rights at as low an expense as possible, knowing that in a few years their inventions will come into free and unfettered use, by the public.

We cannot better conclude this brief review of Judge Mason's able Report, than by quoting his own language, in reference to this question. "Fully confident that the interests of the country and the usefulness of this Office would be alike promoted by the course herein recommended, the candid consideration of Congress is again invited to the subject."

Important Patent Decision in the United States Supreme Court.

Israel Kinsman and Calvin L. Goddard *vs.* Stephen R. Parkhurst, appellee.—This was an appeal from a decree entered against Kinsman and Goddard in the United States Circuit Court for the Southern District of New York on the 3d of May, 1851, for $23,220·28, as profits made by them on the manufacture and sale of the Parkhurst Burring Machine, patented by him May 1st, 1845, and which is, in substance, a cylinder composed of narrow thin rings, made of sheet steel, having hooked teeth cut in their peripheries and strung on a light inclined cylinder, with rings of some packing, such as pasteboard between them, the rings of packing being a little less in diameter than the metal rings, so as to leave grooves about 1-16 of an inch deep on the surface of the cylinder between the metallic rings, thus forming a cylinder both stiff and light, to run in connection with carding machines to clean the wool preparatory to its entering the cards. The wool, as the cylinder revolves, being fed to, and caught by the teeth, which form the surface of the cylinder, and drawn into the grooves, leaving the burrs and other foreign substances on the surface of the cylinder to be knocked off by a guard or beater revolving in connection with the cylinder.

Among the defences set up, it was alleged that F. A. Calvert and Charles Sargeant were prior inventors; that Parkhurst obtained the invention from them; that the invention was not useful until made so by Kinsman; and that Kinsman and Goddard did not infringe the patent because they made the spaces or gullets between the teeth small instead of large.

George Gifford, Esq., of New York, who has been counsel for Mr. Parkhurst from the commencement, and in obtaining the decree in the Court below, argued the cause for him, and in favor of the decree in this Court. Charles M. Keller, Esq., who was not in the case in the Court below, argued the cause for Kinsman and Goddard against the decree.

The Supreme Court, on the 26th of Feb., decided the appeal in favor of Parkhurst, affirming the decree, with costs, and ordered interest, thereby overruling the defences and confirming the patent. Mr. Justice Curtis delivered the opinion of the Court.

Gold and its Uses.—No. 1.

Gold is one of the oldest of metals, and has been known and used by all nations—savage and civilized—from the dawn of history. It exists native in nearly every part of the world, as a metal, or associated with other metals It is of a brilliant appearance; a beautiful yellow color; is malleable and ductile, and is transparent in thin leaves. It is fusible at a full red heat; crystallizes partially when slowly cooled, and is not acted upon like zinc, copper, tin, or iron, by ordinary agents. That is, these metals are readily oxydized by some acids, moist gases, and exposure to a moist atmosphere, whereas gold is not readily acted upon by acids, and it stands exposure, untarnished, in the atmosphere for centuries. It has always been the most valuable of metals, owing to its scarcity, its beauty, its unoxydizable nature, and the facility with which it can be worked into any form. It comes down to us as a matter of history, that the ancients were acquainted with a method of reducing gold to fluid, and retaining it for any length of time in that state. We believe this may be set down as fabulous.

GEOLOGY OF GOLD—The present age is most remarkable for great discoveries of gold deposits in possessions belonging to nations whose inhabitants speak the English language. California and Australia have become watchwords for attracting the emigrant from the banks of the Thames, the Danube, the Seine, the St. Lawrence, the Merrimac, the Hudson, and the Mississippi; and the Chinaman from the shores of the Yellow Sea.

No one can tell why it is that gold is found in one part of the world and not in another. If it be true that this globe once existed as a molten mass, gold should be found as a component part, equally distributed among all similar rocks in every part of the world. Sir Roderick Murchison believes gold to be a peculiar production of the Silurian era, and that it is, as it were, "a silurian fossil." The rocks, however, of California and Australia, from which such large quantities of gold have been recently obtained by digging and washing, belong to the primary series, and not to the fossiliferous or sedimentary beds. The primary laminated rocks of our globe are always found more or less on edge, and their vertical cleavage planes are not due to the direction of chains of mountains, for they pass over mountains, but they appear to be due to currents of magnetism, or electricity, which seem to exert a crystallizing power.

Gold is found in scales, and in nuggets or pebbles, of every size. Its appearance is that of having once been combined with the primary slate rocks, and then separated by superficial actions of air and moisture. By the aid of surface moisture, and the absorbing action of the roots of large trees growing on the edges of gold bearing rocks, many of them have been gradually disentegrated and decomposed, leaving the gold behind, precipitated and aggregated into masses. Some of the largest gold nuggets of Australia had been found under such circumstances. It is a common opinion that gold is always found in greatest quantities in *drift*; in the deep still corners, and eddies of rivers, but it has not thus been found in California. On the contrary, it has been found most abundantly in the *ripples*, as they are called, those parts of streams where the edges of the primary gold bearing rocks have been most exposed to the action of moisture and the atmosphere.

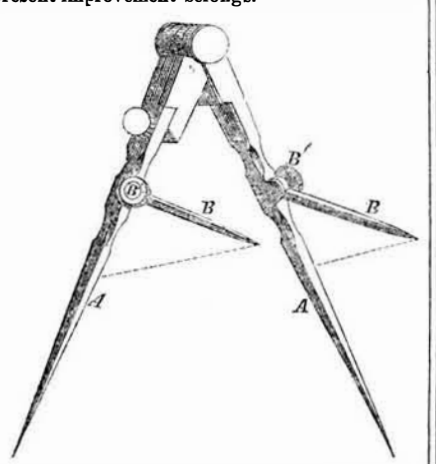
GOLD RESOURCES—The entire amount of gold received at the U. S. Mint and its branches, in 1855, was $55,151,902; of this vast sum, $49,351,789 were domestic produce—nearly all from California. Since 1848 no less than $313,234,000 have been obtained from the California mines. Since 1851, the mines of Australia have produced $200,000,000. The gold produce of Russia is about $6,000,000 per annum, a mere trifle in comparison with that of the United States and England.

The principal use of gold is that of making it into coins, as a medium of exchange to represent and be an equivalent for labor, merchandise, permanent and floating property.

Recent American Patents.

Marble Sawing Machine.—By Schrag and Von Kammerhueber, of Washington, D. C.—This is a very ingenious invention intended for the simultaneous sawing of two sides of a block of marble, the cuts being made at angles or in parallel lines, as desired. Most of the patents heretofore granted for machines of this description have only related to one or two special points, without covering a complete machine. The present patent covers several important points, and inaugurates a new method of operating the guiding and adjusting saws so that the machine, as a whole, may be called original. Without drawings it would be useless to attempt a description. In a future number we shall probably illustrate the invention by engravings.

New Drawing Instrument.—By Henry M. Parkhurst, of Perth Amboy, N. J.—In linear drawings of various kinds it is desirable for the artist to possess some convenient instrument whereby the scale of representation may be accurately changed, either by reduction or enlargement. Such instruments are known as Proportional Dividers, and to this class the present improvement belongs.



Proportional Dividers are generally large, costly, and somewhat clumsy. But the invention here illustrated consists of a simple and inexpensive attachment to the common dividers. A A are the long legs to which the short legs, B, are attached, as shown. This constitutes the chief feature of the improvement. The short legs are fastened by the adjusting screws, B'.

Referring to the cut it will be seen that the spread of the short legs is less than the long legs. In reducing a drawing the dimensions are measured with the long legs, and the short legs will indicate the reduced proportion; if a drawing is to be enlarged, the dimensions are

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taken with the short legs, when the increased size will be exhibited by the long legs. The proportions indicated will vary according to the angle given to the short legs; these may be set by a scale, if desired, the scale being attached at the point of junction of the short legs with the long ones. By turning the short legs down to the sides of the others, these dividers may be used like a pair of the common kind.

Dividers of this kind are, in many respects, superior to other instruments now used for the same purpose, while they are much more simple and cheap. Draughtsmen will readily perceive and appreciate the various uses and advantages of the improvement. It forms an accurate, reliable instrument, and, we doubt not, will find an extensive introduction. We regard it as a valuable invention. For further information address the patentee.

Improvement in Bridges—By Peter C. Guion, of Cincinnati, Ohio.—This invention consists in a peculiar combination of the arch with tension braces, whereby it is alleged that greater security is obtained, at less expense than in other bridges. The materials employed are wood and metal. Without diagrams it would be useless to attempt a particular description.

New Method of Excluding Dust from Railroad Cars.—By Joseph Woods, of Jersey City, N. J.—This improvement consists in enclosing all the open space below the car with latticework, arranged like the lattices of common Venitian blinds. The enclosure extends from the base of the car down as near to the ground as safety permits, the wheels, &c., being covered in.

The inventors allege that the dust is raised by the air which rushes in to fill the vacuum occasioned by the rapid passage of the car, as it sweeps over the surface of the ground.—They also allege that the lattice-work serves to cause a suction from both sides inward, underneath the car, and that the two currents of air, when they meet, unite, and rush backwards to the rear end of train. The dust, as fast as it rises, is thus drawn in beneath the cars, carried back, and discharged at the rear. The improvement is applicable, at very small expense, to all of the ordinary passenger cars. If it will accomplish what the inventor states, it is an important improvement.

Improved Gold Separator.—By Edward N. Kent, of New York City.—Consists in using a grain separator, for separating some of the metal from the earthy particles, in connection with a crusher. The crusher is of the "Chilian form—two large heavy wheels moving around on a circular bed, the quartz being crushed between the wheels and the bed. The improvement here consists in placing the crushing wheels in a deep basin, and submerging them in water. The exit mouth of the separator empties into a tube which conducts the quartz down beneath the water, and deposits it upon the bed of the crusher.

Cockroach Trap—By C. H. Guard, of Brownsville, N. Y.—In this contrivance there is a curious arrangement of tubes and falls, into which the unfortunate vermin are precipitated. The loss of life among them, when this invention comes into use, will be shocking to contemplate; but housekeepers, we presume will regard the operations of the trap with complacency.

Machine for Cutting out Shirt Collars.—By O. W. Edson, of Troy, N. Y.—This consists of a combination of blades, cams, levers, &c., whereby a hundred shirt collars of the most fashionable form may be cut out almost as quick as a single one by the common hand method. The claims of the patentee will be found in the official list.

Recent Foreign Inventions.

A Stationary Piston for Steam Engines—A patent has been granted in England to C. J. Symons, for constructing a steam engine with a fixed piston and a movable horizontal cylinder supported on a pair of wheels, and which has attached to it a bracket connected to a rod to communicate motion to the crank.—None of our engineers, we presume, will blunder on the construction of such an engine.—To make the steam drive the cylinder instead of the piston, may be a novel method of applying steam, but not a good one.

Spiral Railway Spikes—A patent has been taken out by George Hopper, of London, for a new railway spike for fastening the chair to the sleeper. The spikes are twisted spirally, so that they revolve when driven into the sleeper, and hold the chair to the seat with all the firmness of a screw. The round part under the head is tapered conically, so as to fit with accuracy the hole in the chair, by which means any side vibration of the rails is effectually prevented. The London *Railway Gazette* says, respecting it, "Mr. Hopper has already made nearly 1000 tuns of spikes, and has recently taken out another patent for an improved form of "swaging rolls" to facilitate their manufacture. While the cost of ordinary wooden treenails is £4 per 1000, the cost of the improved spike varies according to the price of iron, from 70s. to 110s. per 1000; but as they may be guaranteed for 20 or 30 years, they may be considered much cheaper in the end."

About eight years ago, a Boston mechanic brought a spike of the same kind as the above described one to our office, and left it with us for some weeks. He once intended to apply for a patent, but why he did not we cannot tell. His spiral spike was intended for shipbuilding; it could be driven home without boring, as it was so made that continued blows on its head made it enter timber like an auger.

Concentrating the Coloring Matter of Fresh or Spent Madder—E. J. Hughes, of Manchester, patentee.—This inventor takes a fibrous or porous substance, such as cotton, wool, or sponge, and steeps it in a mordant calculated to combine with the coloring madder, &c.—When the material is thoroughly saturated, he subjects it to the action of the necessary processes to remove the acid and thoroughly precipitate the mordant on the material, as is usually done in calico printing. He then puts the material thus prepared into water with the madder or any preparations thereof. He heats the water, and leaves it a sufficient time to allow all the coloring matter to combine with the mordant fixed on the material, after which he exposes the material to the action of a strong acid, such as sulphuric, muriatic, &c., either slightly or much diluted, for a sufficient length of time to dissolve or decompose the mordant, and carbonize or dissolve the fibrous or porous material. When this is accomplished he puts it on a filter and washes and neutralizes it until the acid is removed. The residue is then the concentrated coloring matter he wishes to obtain.

For the delicate pinks on fine muslins this is a good plan of obtaining a refined extract of madder color; but for common purposes, the process appears to be a very expensive one.

Generating Steam by Friction—H. Dembinski, of Paris, has taken out a patent in England for obtaining heat from friction to generate steam. The object of the invention is to generate steam without combustion. We cannot understand how M. Dembinski is to obtain his power to work his friction rods in generating steam, excepting by the employment of mules to turn the crank. It is very evident that he cannot generate as much steam by friction as will work his friction apparatus.

Boiler Furnaces—T. Barling, of London, has obtained a patent for constructing fire bars and furnaces as follows:—The fire bars are hollow, and steam is forced into the chimney, to increase the draft and keep them cool. The fire bridge behind the grate is built close up to the boiler, and the gases of combustion have to pass through the solid fuel and the grate spaces to the bottom of the boiler and the flues.

Accoustic Railroad Signals in Great Britain—An invention for signaling on trains has been tried on the South-Western Railway, England. The apparatus consists of a gutta percha tube extending through the whole length of the train. It is formed in sections—a joint for each car—and these are fastened together when in use. This tube is connected with an air-pump in the front, and at the end of the train. By a stroke of this pump the air is forced through the tube to the opposite end of the train, and produces a very loud and shrill whistle at the mouth-piece attached to the tube in each guard's van, and to a mouthpiece which extends also close to the engineer. Printed instructions are placed in the hands of guards, engineers, and stokers, which state that one whistle means "look out," two whistles signify "caution," and three whistles denote "danger." Its object is the same as the bell or gong used for signalizing on our trains, and is, in our opinion, not an improvement.

Selling Patent Property by Sample.

MESSRS. EDITORS—In Maine they have a law to prevent citizens of other States selling goods by sample there without a license. Can this law be made to apply to patented articles? or can a patentee be compelled to purchase a license to sell in any State an article which the United States Government has given him the exclusive right to make, use, and vend for a limited period? O. L. R.

Dover, N. H., Feb. 18, 1856.

[This is a simple question relating to the judicial power of a State in making a law to regulate the sale of property or merchandize. The State of Maine and every other State has the power to make such a law as that referred to; and it includes "patent property" the same as common merchandize. A patent does not confer any privilege upon an inventor in regard to his property in making and selling it in any State, which any other citizen does not possess in regard to any other species of property recognized by civil and common law. The Government, by patent, grants to an inventor the exclusive right to make, sell, and use his invention for a limited period, but this simply means that no other person can do so without his consent. The law mentioned above is an act for the regulation of trade within the borders of a State; it does not take away any natural right which an inventor possessed before his patent was granted; and it does not place his property on a different platform from that of other property belonging to other citizens. Were the case otherwise, the United States would have to become a party in patent property suits. In relation to such a question Judge Hopkinson says.—

"On a careful review of the Patent Laws of the United States I have found no indication of an intention that the United States are to be brought in as a party to a litigation respecting the validity of *any* rights claimed or denied under these laws. On the contrary, these rights are considered as the private rights of the party who has obtained them, and are afterwards to be impeached and defended as such."

Making a Needle.

Needles are made of steel wire. The wire is first cut by shears from coils into the length of the needles to be made. After a batch of such bits of wire are cut off, they are placed in a hot furnace, then taken out and rolled backward and forward on a table until they are straight. They are now to be ground. The needle pointer takes up two dozen or so of the wires, and rolls them between his thumb and fingers, with their ends on the grindstone, first one end and then the other. Next is a machine which flattens and gutters the heads of ten thousand needles an hour. Next comes the punching of the eyes; and a boy does it so fast the eye can hardly keep pace with him. The splitting follows, which is running a fine wire through a dozen, perhaps, of these twin needles.

A woman with a little anvil before her files between the heads and separates them. They are now complete needles, but are rough and rusty, and they easily bend. The hardening comes next. They are heated in batches in a furnace, and when red hot are thrown into a pan of cold water. Next, they must be tempered, and this is done by rolling them backward and forward on a hot metal plate. The polishing still remains to be done. On a very coarse cloth needles are spread, to the number of forty or fifty thousand. Emery dust is strewed over them, oil is sprinkled, and soft soap daubed by spoonfuls over the cloth; the cloth is then rolled hard up, and, with several others of the same kind, thrown into a sort of wash-pot, to roll to and fro for twelve hours or more. They come out dirty enough; but after a rinsing in clean hot water, and tossing in saw dust, they look as bright as can be, and are ready to be sorted and put up for sale.

Wonderful Presence of Mind of a Railroad Conductor.

Recently, while the Eastern and Western trains were out of time at night on the road, one of them was unprovided with a lantern, in which case the conductor went ahead of the train with his own lantern, while the train followed slowly at a distance behind. Unfortunately, his lantern went out just as his ear was struck by the noise of the Western train rapidly approaching. The night was so dark he could not be seen, and he was not able to raise his voice above the wind and the noise of the passing train, so as to attract the attention of the engineer. His first resort was a club. He seized one and threw it at the locomotive, but the wooden missile glanced off from the engine without making a noise. The train was flashing past. Taking his own lantern, he hurled it at the lantern of the passing locomotive just as it came opposite to him. The crashing glass and the extinguishment of the light startled the engineer. A sharp whistle was heard, the brakes were shut down, and the train stopped. All was safe, when but for the throwing of that lucky lantern scores might have been killed and wounded. But how stupid and reckless it was for the train to be going on without a lantern.

New System of Weights and Meauress.

We have received quite a number of communications on this subject, since we published the articles of Mr. Wilcox, on pages 134 and 142. It is impossible for us to present a tithe of the substance contained in these communications. Some of these agree with the views of Mr. Wilcox, others do not. All, however, agree in the necessity of a reform in our systems of weights and measures. We must therefore tell Members of Congress that there are hundreds of thousands of our citizens expecting they will do something before this Session closes in relation to effecting such a reform.

American Turret Clocks for Siam.

We learn that John Sherry, Clock Manufacturer, Sag Harbor, N. Y., has received an order for three turret clocks for Siam, one of which is designed for the King's Palace. These, it is said, will be the first turret clocks ever introduced into that Empire. The order is in good hands. The SCIENTIFIC AMERICAN goes almost every where, and among other places to Siam. We have several subscribers there, and presume it was in consequence of some notice in our paper that Mr. Sherry received the above commission.

Stone Tortoises, Hyenas, &c.

The St. Louis *Democrat* states that Dr. Hayden, a young man of that city, a devotee of natural science, has collected gems of the science from the regions surrounding the Missouri river. These gems consists of fossil tortoises of immense dimensions, sea shells of infinite variety and beauty, (an ammonite, of a single curl, twenty-five inches in diameter and a foot in thickness,) skulls of the hyena, the crocodile, monkeys, petrified forest trees, and varieties of fossil flora, are a few of the specimens that make up a various and wonderful collection.

Photographic Pictures on Silk.

Daguerreotype pictures are fast disappearing in our city. Photographs are rapidly driving them out of existence. The correctness of the photographic pictures now taken by our best artists, is remarkable. We have also been highly pleased with the beautiful photographic pictures taken on silk and glass, by Mr. Charles. R. Meade, No. 233, Broadway. If a person wishes to have the likeness of his beautiful self taken on silk, Mr. Meade can do this for him on a white silk handkerchief; and unlike one taken on paper, or a metal plate, this picture, like his face, can undergo ablutions without being effaced. Whether it be owing to the nature of our atmosphere, or the superior skill of our artists, we cannot tell, but their photograph, daguerreotype, and ambrotype pictures far surpass those taken in Europe.

A line of powerful screw propeller steamers is shortly to commence running between New York and Cork. Some wag says that it is to be called the Cork-screw Line.

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TO CORRESPONDENTS.

W. S. F., of Mass.—The object of "Farmer," as we understand it, is to procure a machine for cutting feed for cattle. There are no doubt plenty of machines capable of doing all he calls for. Our object in publishing his communication was merely to bring out the dormant inventions for this purpose.

W. F. R., of Pa.—The device you describe for collecting fares in omnibuses, we think is new and patentable, as we never saw anything like it. As to the probability of its being valuable, this is a question very difficult to answer, and can only be solved by time. You had better send us a small model of it for examination.

W. D., of N. Y.—A minor can take a patent in his own name, but it is subject to the control of his parents or guardian the same as any other property he may become possessed of.

M. & C. P., of Md.—Those machines which you have sold, and which have passed out of your hands previous to the patent issuing, you are not obliged by law to have stamped "patented" after the patent issues, but it may be wise for you to do so if they can be easily found.

W. N, G., of Ill.—Pictures of engravings are transferred to stone in every lithographic printing establishment. Wash your ears with cold weak soap suds, using a syringe, and endeavor to keep their orifices extended a little by pressing frequently with the small finger. This course has cured partial deafness in some cases; it may, however, not benefit you, but it cannot do you any harm to try it.

T. D. H., of ——We do not remember to have seen a rotary pump constructed and operated like yours, and we should think a patent might be secured for it, although, as you are doubtless aware, a great many modifications have been made in this class of pumps. Your letter does not inform us in what State you reside, and as there is a Sharon in almost every State in the Union, we are unable to address you a circular of information.

J. M. W., of Ohio—We have frequently alluded to the subject of plowing by steam power, and have published engravings of steam plows, but as yet no machinery has been successfully introduced for this purpose.

E. C., of Ohio—Agitation alone will separate the butter from sweet milk in a glass bottle. We saw this done 30 years ago. Your principle of action in churning is no doubt correct. The making of soap from cotton seed is a grand idea.

H. R., of N. Y.—The tyres on the driving wheels on the Central Railroad, N. Y., are at least three inches thick through the flanges.

G. H. F., of Mich.—Yours came too late to notice the potatoes, but we had used them ourselves in a steam boiler sixteen years ago.

M. J., of Pa.—There is no liquid in existence for mending broken tea spoons and steel.

A. M. S., of Pa.—The only reason we can give why the water did not freeze in the tea cup when placed in a tin pail, while the water in the latter froze, is that stone ware is a bad conductor. Frozen water in a tin cup can be thawed in a shorter period than water in a common tea cup.

P., of Mass.—The information you suggest relating to thermometers can easily be obtained in all good works on natural philosophy. You can obtain a copy of Mr. Vaughan's patent, by paying the proper fees. We hope some thing will be done towards reforming our system of weights and measures by the present Congress.

W. B., of Pa.—"Lyell's Geology," and "Dana's Mineralogy," will give you a general knowledge of these sciences.

J. D., of Ia.—A good illuminating gas cannot be made from zinc and hydrochloric acids. Such paragraphs as the one you mention are common in papers; they cannot be trusted in matters of science.

C. B., of La.—We publish more useful receipts than any other paper. The chlorate of potass may be put on the sand paper, and the phosphorous on the matches, but this plan is no more safe than the old method. There is no substitute for brimstone. You can procure a machine in this city for making round matches, but we do not know the price of it.

U. P. K., of N. Y.—Hydraulic cement applied to the outside of a timber building to make it fire proof, will soon crumble and scale off. A layer of thick lime whitewash, containing some sulphate of zinc, alum, and salt, will answer much better.

P. B., of C. E.—A British subject cannot take a patent in this country in company with an American citizen, and thereby avoid paying the $500 fee. The fee would be the same as if both were foreigners.

E. B., of Mass.—$1·13 received; all right.

J. C. R., of Pa.—We are not able to give accurate information on the subject brought to our notice. We do not know what the government is doing with the Minie rifle.

D. H. M., of Geo.—Mitchell's machine for setting type is now successfully employed in the printing establishment of John F. Trow, of this city. The last volume of Irving's "History of Washington" is being composed entirely by this machine. There are several patents for such machines, but as yet none except Mitchell's have been brought into successful use. We cannot refer you to any publication that contains engravings of all the type setting machines invented up to this time.

N. P. S., of Mass.—Feeding paper to a printing press in an endless sheet, and printing it in the manner you propose, is an old arrangement, and has frequently been suggested to us for consideration.

W. S., of Nova Scotia—There appears to be some patentable novelty in your method of straining saw frames so as to enable the rake of the saw to be shifted to any feed that may be required by the same movement that alters the feed of the carriage, but you could not, under our laws, obtain a valid patent for it, owing to the fact that the invention has been in public use for more than two years. This is an effectual bar to obtaining legal protection for it.

F. B. W., of Conn.—Yours is a question we have never had propounded before, but we suppose no American vessel could use your invention for the treatment of whale oil on the high seas any more than while in your port of New London.

C. & A., of N. J.—We do not remember the name of our Georgia correspondent.

H. R. B., of ——We cannot ascertain from the Patent Office whether your caveat is upon file or not. The case ot having passed through our hands, we could not be recognized by the Office as the proper parties to ask for uch information. The Commissioner will inform you if you write to him.

J. H. D., of N. Y.—The patent you refer to is not for bringing the exhaust steam into contact with the feed water, after passing throngh cylinders for drying paper. We are not acquainted with a good work on paper making.

S. T. V., of L. I.—The common india rubber shoes now manufactured are composed of india rubber varnish painted on a body of cotton cloth. To mend them, you must sew the hole in the cloth, then put on the varnish with a brush.

Money received at the SCIENTIFIC AMERICAN Office on account of Patent Office business for the week ending Saturday, March e, 1856:—

J. A. W., of Iowa, $25; M. N., of Pa., $25; J. R., of Miss., $25; A. J. B., of N. Y., $25; D. M. S., of N. Y., $20; W. E. S., of N. Y., $30; J. R., of Pa., $25; J. McL., of Mich., $30; M. S., of O., $25; H. S. V., of Ind., $20; W. H., of O., $10; M. M., of Mass., $25; B. O'R., of N. Y., $70; P. L., of Mich., $30; W. W. M., of Ill., $30; A. A., of Del., $35; J. O., of Ill., $30; H. & S., of Ct., $30; A. E. C., of Pa., $5; E. D., of Mich., $25; J. C., of N. J., $20; N. H. L., of S. C., $70; B. G., of Mass., $10; St. J. & B., of N. Y., $250; D. W. C. W., of Pa., $30; N. A., of N. Y., $20; A. R., of Cala., $30, L. F. C., of Me., $30; L. & J. D., of Ct., $60; T. J. C., of N. Y., $100; M. N., 2nd., of N. Y., $25; J. L., Jr., of Ill., $30; I. S., of R. I., $30; G. N. B., of Cala., $33; J. P., of N. C., $50; J. C., of Pa., $12; T. P., of Ala., $32·50; G. H. L., of N. J., $25; P. L., of N. Y., $25; R. G. P., of N. Y., $25; J. B. H., of N. Y., $15.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, March 1:—

G. H. L., of N. J.; A. J. B., of N. Y.; A. A., of Del.; J. A. W., of Iowa; P. L., of N. Y.; R. G. P., of N. Y.; H. A. C., of Mass.; J. R. of Pa.; M. S., of O.; M. N., of Pa.; M. M., of Mass.; M. N., 2nd, of N. Y., J. B. H., of N. Y.; B. & D., of Mich.; J. D., of Ind.; E. N., of Ind.; W. S. G., of N. Y.

Important Items.

BACK NUMBERS VOLUME XI—We are no longer able to supply complete sets of the present volume. The numbers which are entirely exhausted are 6, 12, 14, 15, 17, and 19. Any other numbers up to the present we are able to supply to any who may wish them. Those who order the back numbers from the commencement of the volume will receive such as we have, and their subscription will be entered up enough longer to compensate for the numbers which we are unable to supply.

RECEIPTS—When money is paid at the office for subscription, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a bona fide acknowledgment of the receipt of their funds.

Terms of Advertising.

4 lines, for each insertion,	$1
8 " " "	$2
12 " " "	$3
16 " " "	$4

Advertisements exceeding 16 lines cannot be admitted, neither can engravings be inserted in the advertising columns at any price,

☞ All advertisements must be paid for before insert ing.

VALUABLE PATENT COTTON CORDAGE Machinery for Sale on the most reasonable terms, with Rights for New York, New Jersey, and Connecticut. The great advantage of the Patent lies—1st, in the peculiar mode of spinning, by which two twists are put in at each revolution of the flyer; and 2nd, in the peculiar mode of laying, by which a very important point is gained, with reference to heavy or large cordage, in having the stock to stand still, thus allowing the machinery to run much faster than any other ever before invented for the purpose of making cordage or rope. This highly finished machinery, which is all in first-rate running order, is nearly new, and consists of seven four-bobbin spinners, and two layers. Three connected second-hand boilers, of 100-horse power, also for sale. The attention of Southern Manufacturers particularly is called to this advertisement. HECKER & BROTHER, 201 Cherry st., New York, Feb. 29, 1856. 23 1*

MOFFIT'S PATENT THRESHER AND SEPARATOR—Having obtained the right to manufacture and sell this celebrated machine for any part of the United States, America, or Europe, we are making a very large supply of different sizes, and can fill orders for any of them, at short notice. Our place of business is centrally located and accessible to all of the leading thoroughfares of the country. Our machines are warranted to be perfect in construction, workmanship, and material.—Descriptive pamphlets and circulars with certificates and references, sent to persons desiring information about them. OWENS, LANE & DYER, 26 2* Hamilton, Butler County, Ohio.

WHIPPLE'S PATENT NIPPER BLOCK—Holds fast all that is gained from pull to pull, gently lowers down any burthen, or keeps it safely suspended; works well by hand or horse. Is perfectly safe under all circumstances. Is simple and strong. Manufactured by Whipple & Co. GEO. GAY, General Agent for sale of rights, Hopedale, Milford, Mass. See engraving and description in SCI. AM. 26 3*

HOPPER'S IMPROVED BENCH PLANE—The patent right on this plane—a description of which is contained in the SCIENTIFIC AMERICAN, No. 25—is held and for sale by JOSEPH LUDEWIG, 31 Pine st., Room 10, New York City. 26 2*

INVENTORS AND PATENTEES desiring to sell either rights or patented articles of real value would do well to address Amsden & Phin, Patent Dealers and Brokers, Rochester, N. Y., who can also offer to capitalists rare inducements for investment in valuable inventions. 1*

DRAWING INSTRUMENTS—The largest stock in the country, comprising our well-known German silver Swiss instruments, and German, French, and others Surveying and engineering instruments, warranted of the best construction and quality. Catalogues gratis. AMSLER & WIRZ, 26 6eow 211 Chestnut st., Phila., Pa.

PAGE'S PATENT PERPETUAL LIME KILN will burn 100 barrels of lime with 3 cords of wood every 24 hours, and save 50 per cent. in labor, &c. Kilns are used by J. Lock, St. Louis, C. Crocket, Rockland, Me., F. B. Sibley, Detroit, Mich., Wm. Baldwin, Cherry Valley, N. Y., John Sands, Armounck, Westchester Co., N. Y., L. Thompson, Rochester, N. Y. 26 6* C. D. PAGE, Patentee, Rochester, N. Y.

TELEGRAPH—Any person willing to furnish means for securing foreign patents on a simple, unique, and perfect self-adjusting magnet for telegraphic purposes for an interest in the same, may address ANDREW COLEMAN, Perth Amboy, N. J. 1*

PARTNER WANTED—A practical man, with a small cash capital, to engage in the Sash, Blind, Door, and Planing business, in one of the best locations in the State of New York. The Sash, Blind, and Door business has been carried on successfully for twelve years by the advertiser. All the machinery turnished for the business. References exchanged. Address C. B. MORSE Rhnebeck, N. Y.

STEAM ENGINES—Brooklyn, February 7, 1856.—MR. JOHN H. LESTER: Dear Sir:—In compliance with your request, I take pleasure in stating that the engine I purchased of you in April, 1851, has performed to my entire satisfaction. It has been in operation nearly every working day since I purchased it, never being compelled to stop for repairs; indeed, I think the whole cost of repairs during this time, has not exceeded $20. The power it transmits has been a matter of great surprise to the numerous visitors which we are constantly having to see its operation. We have never had occasion to use the amount of power guaranteed by you, viz.:—100 horse, with 100 lbs. steam, but have found no difficulty in working 95 horse with 80 lbs. steam—and even this is a matter of great astonishment to all practical engineers and engine builders who have seen it—the engine having only 13 inch cylinder and 3 feet stroke. You are at liberty to refer any one to my establishment, "The Brooklyn Planing and Molding Mill," corner of Bridge and John sts., where it can be seen in operation every working day.

Yours truly, SAML. W. SLOCUM.

These engines can be purchased of the manufacturer, JOHN H. LESTER, 57 Pearl st., Brooklyn, N. Y. 1*

TO INVENTORS, ENGINEERS, AND Machinists—Models for Inventors, and wooden patterns for machinery and buildings of every description furnished at moderate terms, by G. HAGGENMULLER, 106 Center street, New York. 26 4*

H. WELLS & CO., Florence, Hampshire Co., Mass.—Manufacturers of double and single patent premium Circular Saw Mills, of various capacities and styles, unsurpassed in point of Finish, Durability, and Utility. Morrison's Patent Shingle Machines, which rive, shave, and joint perfectly, 60 shingles per minute.—Self-Setting, Shingle, and Lath Sawing machines. Carpenter's Patent Rotary Force Pumps, admitted the best in the United States. Saw Mandrels, Sets and Set Punches, Mill Gearing, Shafting, &c. Orders by mail will receive prompt attention, and Cut, Circulars and Price Lists furnished when desired. 25 6t eow

ARTIFICIAL LEGS—Palmer's Patent—Manufactured at 378 Broadway, New York, Springfield, Mass., and 376 Chestnut st., Philadelphia, by PALMER & Co.—These legs are universally regarded, and recommended, as an invaluable boon to all who have suffered mutilation by amputation, by all of the first surgeons in Europe and America; by all the Institutes for the promotion of Arts, and by the several thousands of persons now blest with them in their daily use. Pamphlets containing the most reliable information are sent gratis to all who apply for them. 25 6 eow

PATENT FOR SALE—Improved Cooking Stoves—adapted to North, South. City, Shipboard, wherever great economy of fuel is desirable. A very profitable investment for Stove Manufacturers, Capitalists, &c.—Agents wanted to sell rights for States. Address JOS. B. LANCASTER, Tampa Bay, Fla. 25 2*

STEAM PUMPS AND FIRE ENGINES—Steam Pumping Engines for wrecking purposes, Irrigating and Draining Lands, Deep Mining Shafts, Quaries, and Excavations, Railroad Stations, Factories, Public Institutions, Hotels, Gas Works, Steamers, &c. Also a large and improved class of Pumping Engines for supplying Cities, Towns, and Villages. Apply to H. R. WORTHINGTON, 23 Broadway, New York City. 25 13*

A. L. ARCHAMBAULT, Portable Steam engine Builder, 15th and Hamilton st., Philadelphia.—Saw Mill Engines on Wheels from 10 to 30-horse power. Also Hoisting, Pumping, and Pile driving Engines, from 3 to 30 horse power. 25 8*

NORTH AMERICAN MACHINE AND COOPERAGE Co., at Elmira, Chemung Co., N. Y.—Manufacturers of Trapp's Patent Barrel Machines, being the only establishment in the world that manufactures machinery for all varieties of cooper ware, viz.: Tight Barrels, such as Pork, Beef, Whiskey, Beer, Fish, Oil, Spirits of Turpentine, Beef Tierces, Butter Firkins, White Lead Kegs, Flour, Salt, and Lime Barrels. Stave and Heading Saws constantly on hand. Also Rights under Trapp's patent for sale. M. H. FERRIS, Agent, Elmira, N. Y. 25 6*

WOODWORTH'S PATENT Planing, Tonguing, Grooving Machines—Double machines plane both sides, tongue, and groove at one and the same time, saving one half of the time when lumber is required to be planed on both sides. Large assortment constantly on hand. Also steam engines and boilers of the best quality. Warranted to give entire satisfaction to purchasers, JOHN H. LESTER, 25 8* 57 Pearl st., Brooklyn. L. I.

WANTED—A Foreman to take charge of a Door, Sash, and Blind Manufactory. Also a Foreman to take charge of a Planing Mill. None but those entirely competent, and the best of references, need apply. Address COTES & DAVIES, Davenport, Iowa. 25 4*

NEW INVENTIONS WANTED—I wish to purchase one or more Original Inventions in the Stationery line. WILLIAM BURNET, Post Office, Box 4532, New York City. 25 3*

BOILER INCRUSTATIONS—No scale will form in the boiler when Weissenborn's Patent Incrustation Preventor is used. At the same time the apparatus is the best Heater that can be obtained. Apply to E. W. SARGENT, Delmonico's Hotel, New York City. 25 12*

PATENT STAMPS conferring the privilege of manufacturing or having manufactured Arthur's Patent Air-tight Self-sealing Cans, will be sold during the coming season throughout the South, West, and South West. These stamps can be sent by mail. For further information address R. ARTHUR, 252 Walnut st., Philadelphia, Pa. 24 5*

FILMER & CO., Electrotypers, and Manufacturers of Electrotype Materials, 128 Fulton st., N. Y. Molding Presses, Batteries, Cases, Backing Pans, Shaving Machines, Metal Kettles, Planes, Blocks, Building Irons, etc., etc., on hand, or furnished at short notice, and at moderate charges. Adams' Improved batteries and black-lead machines also for sale. 23 tf

LINEN MACHINERY—JOHN R. McNALLY Champlain, N. Y. Agent for the sale of linen machinery of every description, new and second hand. Engineers and machinists tools, and linen yarns of every number and quality. 22 13*

MACHINERY—S. C. HILLS, No. 12 Platt street, N Y., dealer in Steam Engines, Boilers, Planers, Lathes Chucks, Drills, Pumps; Mortising, Tenoning, and Sash Machines, Woodworth's and Daniel's Planers; Dick's Punches, Presses, and Shears; Cob and Corn Mills; Harrison's Grist Mills; Johnsen's Shingle Mills; Belting, Oil, &c 1 e3w

STATIONARY STEAM ENINES FOR SALE—G Horizontal Engines with iron bed frames, and Judson's Patent Valves, good, strong, substantial, plain finished, that will do good service, say from 4 horse power, $215 to 30 horse power, $1,037. Pumps, Boilers, and fixtures can also be supplied when needed. Address 2e3wtf S. C. HILLS, 12 Platt st., New York.

ENGINEERING.—The undersigned is prepared to furnish specifications, estimates, plans in general or detail of steamships, steamboats, propellers, high and low pressure engines, boilers and machinery of every description, Broker in steam vessels, machinery, boilers, &c. General Agent for Ashcroft's Steam and Vacuum Gauges, Allen & Noyes' Metallic Self-adjusting Conical Packing, Faber's Water Guage, Sewell's Salinometers, Dudgeon's Hydraulic Lifting Press, Roebling's Patent Wire Rope for hoisting and steering purposes, Machinery Oil of the most approved kind, etc. CHARLES W. COPELAND, 19 eowtf Consulting Engineer, 64 Broadway.

BALLOONS—Balloons of all sizes made to order, with printed instructions to fill and use them, comprehensive to ordinary minds. A 25 feet diameter balloon, all complete for aerial voyages, $300 Address JOHN WISE, Aeronaut, Lancaster, Pa. 23 4* eow

CIRCULAR SAWS—We respectfully call the attention of manufacturers of lumber to the great improvements recently introduced in the manufacture of our Circular Saws. Being sole proprietors of Southwell's patent for grinding saws, we are enabled to grind circular saws from six inches to six feet with the greatest accuracy and precision. The impossibility of grinding a saw without leaving it uneven in thickness has always been acknowledged by practical saw makers. This causes the saw to expand as soon as it becomes slightly heated in working. When this takes place the saw loses its stiffness, and will not cut in a direct line. We will warrant our saws to be free from these defects; they are made perfectly even in thickness, or gradually increase in thickness from the edge to the center, as may be desired. As there are no thick or thin places, the friction on the surface of the saw is uniform, consequently it will remain stiff and true, and will require less set and less power. Will saw smooth, save lumber, and will not be liable to become untrue. This is the oldest establishment now in existence for the manufacture of circular saws in the United States, having been established in the year 1830. Orders received at our Warehouse, No. 48 Congress st., Boston. 12 6m* WELCH & GRIFFITHS.

ROCK DRILL—The American Rock Drill Co. invite attention to their superior machines, adapted for all kinds of rock work in quarries and mines and especially for artesian wells. They are simple in construction, powerful and accurate in operation, and can be run by hand, steam, or horse power. An engraving and full description appeared in No. 15 of the Scientific American. Apply to T. H. LEAVITT, Agent and Treasurer of the A. R. D. Co., No. 1 Phœnix Building, Boston, 17 3m*

SCHENK MACHINERY DEPOT—No. 163 Greenwich street, New York, keeps always on hand Lathes, Planers, Drills, Steam Engines, Woodworth's Patent Planing Machines, Belting, &c., in great Variety. Tools furnished of any size, to order, and of the best quality. 25 8 A. L. ACKERMAN, Proprietor.

VAIL'S CELEBRATED PORTABLE STEAM Engines and Saw Mills, Begardus' Horsepowers, Smut Machines, Saw and Grist Mill irons and Gearing, Saw Gummers, Ratchet Drills, &c. Orders for light and heavy forging and castings executed with dispatch. LOGAN & LIDGERWOOD, 13 1y* 9 Gold st., N. Y.

IMPORTANT INVENTION—Patented August 14th, 1855. "Garratt's Metal" for Journal Boxes of all kinds, It is anti-friction, absorbs the oil, not liable to break, it can be made cheaper than either brass or Babbitt metal, and after many long and severe tests, has been found to surpass all other metals ever used for the purpose, For the purchase of either State, county, or shop rights under this patent, apply to JOS. GARRATT, Senr., Madison, Indiana. 13 3m

1855-6.—WOODWORTH'S PATENT Planing, Tonguing and Grooving Machines.—The subscriber is constantly manufacturing, and has now for sale the best assortment of these unrivalled machines to be found in the United States. Prices from $35 to $1450. Rights for sale in all the unoccupied Towns in New York and Northern Pennsylvania, JOHN GIBSON, Planing Mills, Albany, N. Y. 14 3m*

MACHINISTS' TOOLS.—Meriden Machine Co have on hand at their New York Office, 15 Gold street, a great variety of Machinists' Tools, Hand and Power Punching Presses, Forcing Pumps, Machine Belting, &c., all of the best quality. Factory West Meriden, Conn. 17 13*

W. P. N. FITZGERALD, Counsellor at Law—late Principal Examiner in the U. S. Patent Office—has removed from Washington, D. C. to the city of New York, 271 Broadway, (corner of Chambers St.) As heretofore, his practice is confined to Patent Cases, which he will prosecute or defend, as counsel, before the Supreme and Circuit Courts of the United States, also before the Patent Office, or the Judges having jurisdiction of appeals therefrom. 11tf

OIL! OIL! OIL!—For railroads, steamers, and for machinery and burning—Pease's Improved Machinery and Burning Oil will save fifty per cent., and will not gum. This oil possesses qualities vitally essential for lubricating and burning, and found in no other oil. It is offered to the public upon the most reliable, thorough, and practical test. Our most skillful engineers and machinists pronounce it superior and cheaper than any other, and the only oil that is in all cases reliable and will not gum. The Scientific American, after several tests, pronounced it "superior to any other they have ever used for machinery." For sale only by the inventor and manufacturer. F. S. PEASE, 61 Main st., Buffalo, N. Y.

N. B.—Reliable orders filled for any part of the United States and Europe. 19tf

TO MANUFACTURERS AND CAPITALISTS The proprietor of a water power in the State of Iowa, situated within 23 miles of the city of Dubuque, which is capable of running fifty pairs of burrs, or machinery of any kind equivalent thereto, is desirous of disposing of a portion of the same to individual manufacturers or a Company, for the purpose of securing the erection of factories on an extensive scale. The price or terms are no particular object, and both will be made satisfactory to persons having the means and desiring to invest them in the improvement of this power. Correspondence is solicited. Circulars containing full description of the town and water power may be had of J. B. DORR & CO., 24 3* Dubuque, Iowa.

J. HERVA JONES, Inventor of Randall & Jones' Patent Hand Planter, and proprietor of New York, Michigan, Wisconsin, Minnesota, and Northern Illinois, Superior to all. Machines and Rights for Sale. Agents wanted. Send for a circular. Rockton, Winnebago Co., Ill. 22 5*

IMPORTANT TO ENGINEERS AND MACHINISTS—NOTICE—Those wishing to obtain the genuine articles of Metallic Oil and Grease, should send their orders direct to the manufacturer, AUGUSTUS YOCKNEY, Office 67 Exchange Place, New York. No Agents employed. 1 6m*

NORCROSS ROTARY PLANING MACHINE.—The Supreme Court of the U. S., at the Term of 1853 and 1854, having decided that the patent granted to Nicholas G. Norcross, of date Feb, 12, 1850, for a Rotary Planing Machine for Planing Boards and Planks is not an infringement of the Woodworth Patent.

Rights to use the N. G. Norcross's patented machine can be purchased on application to N. G. NORCROSS, 208 Broadway, New York.

Office for sale of rights at 208 Broadway, New York Boston, 27 State street, and Lowell, Mass, 19t

GRAIN MILLS—EDWARD HARRISON, of New Haven, Conn., has on hand for sale, and is constantly manufacturing to order, a great variety of his approved Flour and Grain Mills, including Bolting Machinery, Elevators, complete with Mills ready for use. Orders addressed as above to the patentee, who is the exclusive manufacturer, will be supplied with the latest improvements. Cut sent to applications, and all mills warranted to give satisfaction. 10tf

POWER PLANERS—Persons wanting Iron Planers of superior workmanship, and that always give satisfaction, are recommended to the New Haven Manufacturing Company, New Haven, Conn. 19 tf

NEW HAVEN MFG. CO.—Machinists' Tools, Iron Planers, Engine and Hand Lathes, Drills, Bolt Cutters, Gear Cutters, Chucks, &c., on hand and finishing. These Tools are of superior quality, and are for sale low for cash or approved paper. For cuts giving full description and prices, address, "New Haven Manufacturing Co." New Haven, Conn. 19 tf

HARRISON'S GRAIN MILLS—Latest Patent.—$1000 reward offered by the patentee for their equal. A supply constantly on hand. Liberal Commissions paid to agents. For further information address New Haven Manufacturing Co., New Haven, Conn., or to S. C. HILLS, our agent, 12 Platt street, New York. 19tf

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Science and Art.

The Power of Falling Water.

We often recieve communications requesting information relative to the power of water falls, and sometimes the propositions are so carelessly stated that it is very difficult to understand the exact answers desired. Most of such questions involve considerable calculation and time to work them out, although simple enough in themselves, when understood. The mistake of a figure also, such as a 3 for a 5, in a correspondent's letter, or on our part, makes a very great difference in the answer given. We often refer correspondents to the rules given for estimating water power in the articles on "Hydraulics," pages 296, 304, and 392, Vol. 6, SCIENTIFIC AMERICAN, but as a great number of our present subscribers do not possess that volume, such reference is inapplicable to their case. We purpose, therefore, to present some useful general information on the subject, in two or three short articles, to which reference can be had in the future.

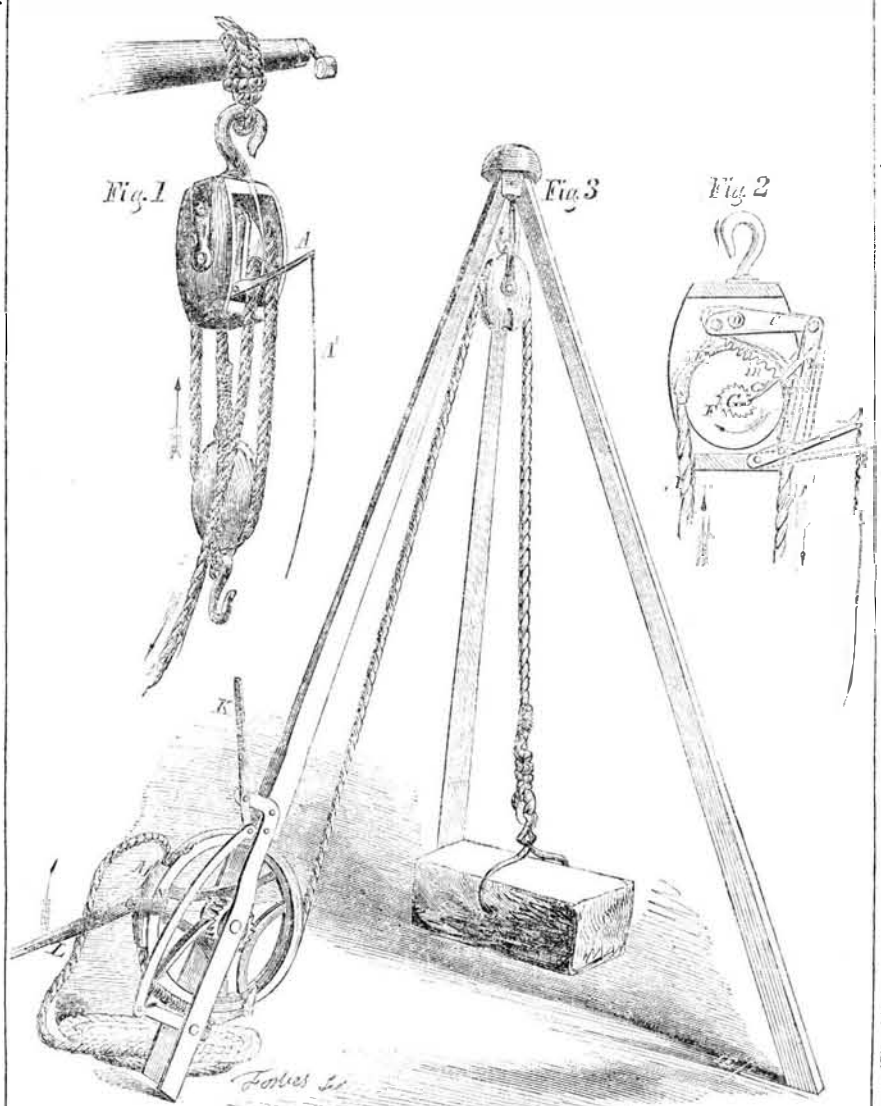
HORSE POWER—The general dynamical unit of motive power amounts to 33,000 lbs. lifted one foot high in a minute, and is called "a horse power," and was first applied by James Watt to his steam engine. It is estimated by the pressure of the steam in pounds exerted on each square inch of piston, multiplied into its velocity. Nothing can be more dissimilar than the action of steam and water; also the action of a steam engine and that of a water wheel; and such a unit applied to hydraulics, at first sight, appears inapplicable. It is, however, a very useful measure applied to estimate the power of all kinds of machines, and we cannot dispense with it until we get a better one.

A steam engine having a piston possessing an area of 20 square inches, steam of 20 lbs. pressing on each inch, and moving with a speed of 82·5 feet per minute is a "one-horse power," 82·5×20×20=33,000. To find out the horse-power of a water fall, the quantity of water in pounds which falls in a minute, is simply multiplied into the hight of the fall, and the resultant divided by 33,000—the quotient is the answer, giving the amount of horse-power. "Thus 550 gallons of water falling 6 feet in one minute, is equal to a horse-power, (550×10 lbs. in a gallon×6 feet of fall÷33,000=1.) In this way of estimating the power of water, it is considered that the quantity which falls from a certain hight in a given time, is equal to elevating a like quantity of water to the same point, in the same time, according to the laws of mechanics. No motor like a water wheel gives out the same amount of power as that applied to it by the water; there is loss from friction, resistance of surface in the flume, and leakage. The more perfect a wheel is, however, the nearer does it come up to returning the whole power of the water. It used to be a rule to deduct one-third of the theoretic power of the water from the actual power of the best wheels, and the best overshot wheels were allowed to exercise only 67 per cent. of the power of the water. Great improvements have been made in constructing water wheels and applying the water properly, within the past few years, and it is now a common practice with some to allow only 25 per cent. for loss, instead of 33 1-3, and this on turbines, while the Lowell wheels of Seth Boyden have been calculated to give out 82 per cent. of the water power.

It is a very easy matter to calculate the horse power of a falling column of water, when we know the quantity which falls in a given time, and the hight of the fall. What is the horse power of 40 cubic feet of water falling per second, over a fall six fet high, 40×62·5 (weight of a cubic foot of water) ×6 (hight of fall) ×60 (seconds in a minute) ÷ 33,000=14·181 H. P. If we deduct 25 per cent. for loss when applied to a good wheel, the actual horse power given out by it under such a fall will be 10,636—a little over 10 1-2 horse power. This shows us that where water is abundant, a very small fall gives out a great deal of power.

The most difficult and troublesome questions connected with hydraulics, relate to ascertaining the exact quantity of water which falls through orifices of given areas, or over wiers, in a given time. How can the quantity of water which falls in a second over a certain fall be ascertained?—and ascertained it must be, or we cannot calculate its power. Measure it, some one answers. This, no doubt, is the only sure and positive method, and could easily be done on very small streams, but not with a gallon measure on large streams, nor by any plan without incurring more expense than nine-tenths of those who run water wheels can well afford to expend. The measurement of effluent water will therefore form the subject of another article.

IMPROVEMENT IN PULLEY BLOCKS.



Whipple's Patent Nipper Blocks.

This invention consists in the attachment of a brake apparatus to the common pulley block, in such a manner that the sheaves can only revolve in one direction, unless freed by the pull of a lever. The weight is thus always prevented from slipping back, and may be held suspended for an indefinite time at any desired point.

In the lifting of heavy weights by means of the common blocks, there is always more or less danger of the slipping of the ropes and the running back of the burden. For example, on ship board, in discharging cargo, the horses employed to work the ropes sometimes become exhausted when the burden is only partially drawn up. For want of some safety checking apparatus like the present, the weight is perhaps dashed down again into the hold, endangering both life and property. The common blocks are also objectionable for want of some means of holding the weight in suspension, at any particular point or moment. All of these difficulties are remedied by the improvements herewith illustrated in figs. 1 and 2, while many other advantages, which we have not space to mention, are obtained.

Fig. 1 is a perspective view of a tackle furnished with the improvement, a section of the same being shown at fig. 2.

The lever, A, it will be observed, is pivoted to the shell of the block, and also connected by means of a rod, B, to the upper brake lever, C. The latter is pivoted at D to the shell of the block, and to its extreme end the clamp piece, E, is attached. The clamp piece, E, is made with a curved, concave surface, and rests upon the rope, I, which passes over the sheave.

The sheave, F, is provided with a ratchet wheel, G, the teeth of which receive the pall, G′. This pall is attached to lever, C, and is held in contact with ratchet wheel, G, by the spiral spring, H. When the parts are in the position shown in fig. 2, the sheave, F, can only move in one direction, indicated by the arrow

If the weight is attached at I, and power applied at I′, the weight will rise, but it cannot go back. The pall, G′, being attached to lever, C, tends, when there is a weight on the rope, I, to lift the lever, C, and so press the clamp piece, E, down upon the rope with a force that is equivalent to that of the weight, which is being lifted. Under all common circumstances, therefore, this is a safety block, the bight of the rope being always held secure by a self-acting contrivance; and the greater the weight lifted, the greater will be the pressure applied to hold the rope; therefore it can never slip.

When it is desired to allow the weight and ropes to run back, the lever, A, is pulled down by means of its cord, A′t his throws pall, G′, out of contact with its ratchet, G, rendering the block operative like the common kind.—If the lever is released the parts resume their previous safety position.

Fig. 3 is a modification of the apparatus just described, showing its application to one of the legs of a tripod, used by stone cutters. When thus arranged the advantages of a double geared winch are obtained, besides other important conveniences. The sheave, J, is provided with a ratchet wheel, pall, and rope clamp, similar to those described in fig. 2; the sheave, J, can therefore only turn in one direction, unless relieved from the ratchet by the lever, K. The lever, L, is used for turning the sheave, and, consequently, to lift the stone.—Lever L is attached to a rope clamp, M, and this latter is combined with the sheave by means of the sliding claws, N, which bend around the inner edge of the sheave, J. When the lever, L, is pulled up, in direction of the arrow, the clamp, M, binds on the rope, which, with the sheave, J, is carried partially around, and the stone is correspondently lifted, the bight of the rope being held by the ratchet and clamp, in the manner shown in fig. 2.—When lever L is pressed downwards, the clamp, M, is released, and slides back into position for a new lift. The only difference between the contrivances shown in fig. 3, and fig. 2 is in the attachment to the former of the extra lifting lever, L, clamp, M, and claws, N.

We are informed that the expense of these Patent Nipper Blocks does not much exceed the cost of the ordinary kind. The parts are quite simple and cannot very well get out of order. Stone cutters, quarrymen, and others, will understand and appreciate the advantages presented by the improved tripod.

The above improvements are the invention of Jonathan Whipple, Jr., and form the subject of two patents, the last of which bears date May 22, 1855. For further information address Whipple & Co., Hopedale P. O., Milford, Mass. [See advertisement in another column.]

Literary Notices.

FAMILIAR SCIENCE:—Or the scientific explanation of the principles of natural and physical science, and their practical and familiar applications to the employments and necessities of common life, illustrated with upwards of one hundred and sixty engravings, by David A. Wells, A. M., Editor of "Annual of Scientific Discovery," "Year Book of Agriculture," etc., Childs & Peterson, Publishers, Philadelphia. The contents of this work is divided under sixteen distinct classifications, viz:—Laws and Properties of Matter, Mechanics, The Phenomena of Fluids, Acoustics, Heat, Meterology, Light and Actinism, Electricity, Galvanism, Magnetism, Inorganic Chemistry, Philosophy of Manufactures, Agricultural and Rural Economy, Geology, and Mineralogy. Each of these subjects is explained in the most familiar manner, by a series of questions and answers, easy to be understood by every class of mind. There is no ambiguity in the use of terms, and all the subjects are invested with an interest which captivates the reader at once, and impresses his mind with the sublime yet beautiful theories of natural science. We have felt much pleasure in the perusal of this work, and can heartily commend it to the use of families and schools. The work is really the "Science of things familiar," and pours a flood of light upon the science of hundreds of subjects externally familiar to all, yet whose cause and effects are never inquired into by the multitude.

A word about the author of this work. Although Mr. Wells is a young man, comparatively, yet he already occupies a most enviable position as a scientific man. His ability and zealous industry in the practical sciences, as evinced in the various works edited by him, have brought his name prominently forward as a successful and truly reliable author and guide. The Annual of Scientific Discovery, commenced in 1851, is, we believe, the first work put to press under his authorship. It has since appeared annually, and has met with the highest commendation from the newspaper press of this country and Europe.

On the first day of February Mr. Wells became a partner in the well-known publishing house of Putnam & Co. No. 321 Broadway, and will now devote his energies to the book business generally. He will give special attention to the purchase of scientific books, and from his known familiarity with such pursuits and subjects, we are satisfied that those of our readers who desire to purchase large or small quantities of books upon sciences, will find the house of Messrs. Putnam & Co. to possess superior facilities for this branch of the trade. We give unusual prominence to this feature of their business, for the reason that our readers are often troubled to know where they can best procure such publications.

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